

EFFECTIVENESS OF CHOICES
IN IMPROVING THE CAREER
DECISION MAKING OF UNIVERSITY STUDENTS

BY

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TO MY HUSBAND, BOB,
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University counselors have a need to develop more effective methods of meeting the vocational needs of their students. A number of studies have established the lack of adequate career counseling services to assist college students with career decision making. Computer guidance systems are a relatively new tool with the potential of aiding students with career concerns. This particular study focuses on CHOICES, a computer-assisted guidance system, that has not been adequately researched due to its relatively new status in the United States.

The purpose of this study was to examine the effectiveness of CHOICES in improving the career decision making of university students through the utilization of the following two instruments: the Career Decision Scale and the Assessment of Career Decision Making. The 136 university students involved in this research study were assigned to either an experimental or a control group using a systematic sampling Pretest-Posttest Design. All of the students who utilized the

CHOICES program during this research project received a follow-up questionnaire six weeks later requesting information concerning the impact of the treatment on them. The purpose of the follow-up study was to provide limited longitudinal information on the impact of CHOICES.

The results of this research project indicate that the utilization of CHOICES as a treatment does increase career decision making as measured by the scores on the Career Decision Scale and the Occupational Scale of the Assessment of Career Decision Making. The higher scores on the Assessment of Career Decision Making after the use of the CHOICES program showed an increase in career decision making relative to occupational choice. On the Career Decision Scale, lower scores after treatment through utilization of CHOICES measured removal of barriers that prevent individuals from making career decisions. Although this study hypothesized that a difference would exist between the effect of CHOICES on males and females as measured by the scores on the Career Decision Scale and the Assessment of Career Decision Making, no statistically significant differences were found. The indication was that CHOICES was equally helpful to both males and females in promoting career decision making.

The follow-up questionnaire, which was sent to 130 students, indicated a positive response to the utilization of CHOICES. The 75 students who returned the survey commented positively on the assistance provided by CHOICES in helping them make an occupational choice.

The implications of this research is that computerized guidance systems such as CHOICES are viable counselor interventions that can

assist in meeting the career development needs of college students.

This study has helped to provide credibility for a counseling tool that is relatively new yet effective.

CHAPTER I

INTRODUCTION

"A butcher, a baker, or a candlestick maker" (no author).

In our modern society, the process of career decision making has become complex due to the specialization of our highly technological society (Blocher, 1973; Ginzberg, Ginsburg, Axelrad, and Herma, 1951). Individuals no longer follow in parent's footsteps becoming tenth generation butchers or bakers. The tasks of career planning and vocational decision-making have become difficult as the individual faces an ever widening range of choices (Moni, 1980). The Dictionary of Occupational Titles in which the U.S. Department of Labor (1977) categorizes and briefly defines many of the available occupational and professional alternatives, lists a total of 20,000 different occupations. Because of the rapid rate of change in our society, "it is conceivable that the majority of students in school today will be employed in occupations that do not yet exist" (Moni, 1980, p.1).

As initially defined by Ginzberg, Ginsburg, Axelrad, and Herma (1951), career decision making is a characteristic that is intimately associated with a modern capitalistic society. This concept has been expanded upon by Katz (1973) and other writers who emphasize that the right to make vocational decisions in our society is a concept that is characteristic of a democracy. Although this is a basic accepted part

of the fabric of our society, a totalitarian system limits occupational choice and does not consider it a personal right.

Career development which leads to appropriate career decision-making is important to the society as a whole. A need exists to reduce the widespread waste of human talents that exists as a result of the maladjustment to the workplace (Beaumont, Cooper, and Stockard, 1978). Rash or inappropriate choices are a contributing factor to this form of waste and are an important social concern. An example of inappropriate choices is the liberal arts student who pursues a curriculum in which few, if any, career opportunities or professions are available. A large number of college students are uninformed about careers and career opportunities and have been unable to formulate a tentative career choice (Beaumont, Cooper, and Stockard, 1978). As discussed by Camp (1976), society must deal with the issue of the utilization of the educated which is an important resource. In an early discussion of the importance of vocational choice to society and the utilization of its human resources, Ginzberg, Ginsburg, Axelrad, and Herma (1951) state the following:

The basic resource of any society is the quantity and quality of the people who compose it. Some individuals inherit special talents and aptitudes and develop them through training. These talents represent scarce resources, and no society can be indifferent about their utilization. It is obviously important to an individual with a marked aptitude for mathematics that he have an opportunity to develop it; it is also important to society that he makes use of such capacity. (p. 4)

Numerous research studies have been conducted which are supportive of the need in our society for improved career development (Sampson,

1977). In the Career Pattern Study (C.P.S.), which is one of the most comprehensive research projects, a twenty-one year longitudinal study was conducted by Super of eighth and ninth grade male students. Between the ages of fifteen and thirty-six, the career development of each individual was monitored with the status of their careers at age twenty-five providing the most meaningful data. During a period of seven years, six different positions had been held by the average individual with one-third of them giving the appearance of floundering and one-half having unstablized career patterns since high school graduation (Super, Knowalski, and Gotkin, 1967).

Gribbons and Lohnes (1969) conducted a similar longitudinal study on the career development from adolescence to adulthood which focused on both sexes. The conclusion of their investigation was the following: "the majority of adolescents are poorly oriented to career development tasks; fully one-third to almost one-half of young adults at age twenty-five appear to be in career-development trouble" (Gribbons and Lohnes, 1969).

Career decision-making becomes more significant to university students as a concern of this period of their life is that a career choice that must be finalized for an adequate school/work transition (Devine, 1975; Beaumont, Cooper, and Stockard, 1978). The value of career decision-making was recognized by Erickson (1959) who said that determining their occupational identity is a primary concern that disturbs young people. Unfortunately, for many students, the pursuit of an university degree is an end in itself. These individuals do not

establish a common link between education and occupational choice, and frequently this results in later frustration (Ginzberg, Ginsburg, Axelrad, and Herma, 1951). Lack of adequate opportunities and encouragement often make career decision-making difficult for college students, as discussed by Korn (1968):

Most college students are given only a year or two in which to find both themselves and a vocational plan for their lives, and too often during this short period, while they are being offered encouragement to explore, their daily academic tasks are at odds with their goals. . . . Much of the structure of higher education encourages them to put aside questions of personal relevance in favor of mastering a complexity of academic subject matter. (p. 207)

Career decisions of many college students are "more often made by default than by a deliberate process of selection" (Burck, 1971, p.4).

Astin and Panos (1969), who studied 36,000 college students, reported that "Only one-fourth of the students reported the same career choice in 1965 as they had in 1961" (p.140). In another study on a university population by Bergeson, Roost, and Phillips (1975), one-third of the students indicated that they had selected the wrong major. Two-thirds of the students interviewed stated that more emphasis needed to be placed by the college on career preparation.

Present-day university counselors are typically inadequate in dealing with this issue which is vital to college students (Devine, 1975; Zunker, 1981). As a result of the lack of an emphasis on vocational counseling in graduate programs, counselors are not sufficiently trained to deal with this problem (Zunker, 1981; Devine, 1975; Graff and Raque, 1974). University counselors associated with

counseling centers frequently view career counseling as uninteresting, resulting in their referring many vocational cases to practicum students or interns (Devine, 1975).

Additionally, when dealing with the career decision making needs of college students, university counselors find it difficult to adjust these needs to the sudden changes taking place in the world (Cassie, 1979). Venn (1964), one of the first researchers to discuss the rapid rate of change of our modern society, described the situation in this way:

It is not simply a case of new sets of social and economic relationships replacing older ones, but of new ones themselves being replaced at a faster and faster rate, with only those adapted to change surviving . . . what is new is the change in the rate of change. (p.3)

Innovative approaches to assist students with career decision making are not widely employed by the majority of university counselors. A need exists for the experimentation with new techniques to assist college students with their vocational problems (Devine, 1975). The use of computer-assisted guidance programs is a new approach which is an example of a relatively recent development in the career counseling field which first gained prominence in the 1960's (Harris, 1974; Katz & Shatkin, 1980).

Computer-assisted guidance is a new approach which can facilitate career decision-making. According to numerous research studies, counselors have not been overly successful in the area of career counseling (Baumgardner, 1977; Cassie, 1979; Devine, 1975; Farmer, 1978; Harris, 1974; Warnath, 1975). For this reason, counselors should examine the practical application of the new computer technology.

CHOICES

During the past twelve to fifteen years, approximately thirty computerized systems of career guidance and information have been developed. However, today only a half dozen or more have survived in this competitive field (Clyde, 1979). The Computerized Heuristic Occupational Information and Career Exploration System (CHOICES), which is a survivor, is a relatively new addition to the computer-assisted guidance systems in the United States (Jarvis, 1978). The CHOICES system was developed in Canada by the Department of Manpower and Immigration through extensive research that involved forty-five to fifty person-years of effort in the computer field (Ruane, 1979). CHOICES was acquired by Florida in 1978 as a result of an international exchange between the Center for Career Development and the Department of Manpower and Immigration (Ruane, 1979; Goldberg, Reardon, and Bonnell, 1980). In Canada, CHOICES was developed to assist individuals who are attempting to make decisions with respect to their personal development in the world of work (Casserly, 1978)

All of the computer-assisted guidance systems, including CHOICES, would benefit by further research. According to Clyde (1979), more external evaluation of computerized guidance systems is needed in order for adequate research to be available. The majority of research on computerized guidance has been conducted by the developers of the individual systems, and the question of objectivity is a concern (Clyde, 1979). Researchers have relied heavily on self-report devices such as questionnaires, and many of these questionnaires are author-

created instruments (Clyde, 1979). Specifically, research with standardized instruments with proven reliability and validity is needed. An additional problem has been the small sample sizes which have been utilized (Clyde, 1979). Adequate sampling is needed in order to improve the possibility of being able to generalize the results.

Further research on CHOICES, in particular, is essential, due to its relatively new status as a computerized guidance system (Cassie, 1979). CHOICES has been utilized in a modified form in Florida since 1978. Although a comprehensive longitudinal study of CHOICES began in Canada in 1976, only a few research studies have been conducted in the United States. New research on CHOICES will provide counselors with needed information to evaluate the value of this new system.

Need For The Study

There is a need for research on the effectiveness of CHOICES in improving decision making in order to validate a new method which would be available to counselors to assist students with significant career decisions. An additional need for this investigation results from the need for more research on the effectiveness of computer assisted guidance systems and specifically on the effectiveness of CHOICES (Clyde, 1979). The existing research on computer systems has not concentrated on CHOICES (Cassie, 1979).

There is a need for new methods to be developed to assist university students in dealing with vocational decision-making since traditional methods have had limited success (Devine 1975). According

to the Carnegie Commission on Higher Education, "Most of the evidence indicates that vocational counseling has tended to be a relatively weak component of college and university student counseling programs . . ."(College Placement Council, 1978, p.81). Career Counseling is not stressed by university counselors due to the lack of adequate training and interest in this area (College Placement Council, 1978; Devine, 1975, Zunker, 1981). It is a low priority in many counseling centers (Graff and Raque, 1974).

The inadequacy of university counseling centers in providing assistance to students in career development and decision-making is partly a result of the lack of available resources and the outmoded theoretical perspective that is held by many counselors (Borow, 1973). The traditional individual approach is utilized by the majority of the counseling centers on college campuses in spite of the development of new innovative methods (Sampson, 1977).

If college students were better able to formulate clearer career goals as a result of the effectiveness of a computerized system such as CHOICES in improving decision-making, they would more fully realize the opportunities of the university academic experience (Beaumont, Cooper, and Stockard, 1978). An individual who is not goal-directed may fall "prey to the amorphous anxiety which leads to poor academic production on the part of many students" (Beaumont, Cooper, and Stockard, 1978, p.34). A goal oriented student can better concentrate because he can see the relevancy of his studies in meeting those goals.

Career and vocational counseling is gaining status as "society has become increasingly concerned that students are not finding experiences in college helpful in moving into meaningful roles in the broader society" (English, 1974, p. 29). These concerns are reflected in the following quote:

Career education and career guidance are currently high priority items on the national agenda as reflected in U.S. Office of Education initiatives, the content of national conventions, professional literature, and the commercial publication of books and products. (Moni, 1980, p.2)

The lack of career counseling services which adequately meet the needs of students has been established (Devine, 1975; Beaumont, Cooper, and Stockard, 1978). Through the use of CHOICES, counselors would be more effective in meeting the vocational counseling needs of students and would, thereby, gain professional status as a result of satisfying the priorities of the public.

An additional need for this investigation results from the need to provide more research on the effectiveness of computer assisted guidance systems (Clyde, 1979). In certain select areas of career guidance, a considerable amount of research has been conducted (Moni, 1980). Holcomb and Anderson (1977), in an overview of vocational research, stated that the most popular topics during a five-year period were the utilization of vocational interest inventories and career preferences.

A need exists to determine the effectiveness of computerized guidance systems specifically in assisting clients with vocational decision making. While discussing the major areas of investigation that

have been conducted on computer assisted guidance, Sampson (1977) provides the following list of variables that have been researched. This list, which does not include decision-making, consists of "vocational maturity, educational course selection, college selection, low ability student populations, and comparison between traditional and computer-assisted counseling" (p. 31). The literature suggests that computerized guidance systems have an impact on decision-making. Tiedeman compares the computer to "a prosthetic device for career decision-making" (Cassie, 1976, p.45). Discussing the capacities that the computer possesses, which have a high potential value in career decisionmaking, Harris and Tiedeman (1974, p. 2) suggest:

- (1) The capacity to store, instantaneously retrieve, and update masses of data.
- (2) The capacity to interrelate data about the person and the environment so that both are relevant to the user at the time of his decision-making.
- (3) The capacity to sort through masses of data, and on the basis of this data, provide a personally-tailored list of educational or vocational options upon command. . . .

Research on all aspects of the CHOICES system is lacking due to its new status. As Sampson (1977) notes, "Most of the existing research has been conducted on the Computerized Vocational Information System, the Educational and Career Exploration System, the Occupational Information Access System and S.I.G.I." (p. 31).

Comparatively little study has been done on the effectiveness of computer-assisted guidance systems with a population of college students; a need exists to provide additional research in this area.

Overall, the present research on computerized guidance is incomplete and dubious since the majority of it has been done by the developers of the particular systems.

Due to the fact that objectivity must be shown to generalize results, research done by the originators of the particular computerized system cannot be relied upon (Clyde, 1979).

Purpose Of The Study

The purpose of the study is to determine the impact of CHOICES a computerized career guidance system, on the decision making of a select group of undergraduate and graduate university students through the utilization of two scales which measure career decision-making. During the research, the following questions are under investigation:

- (1) Is there a relationship between the variable of sex and the amount of assistance which is received in eliminating barriers to career decision making by the CHOICES program as measured by scores on the Career Decision Scale?
- (2) Is there a relationship between the variable of sex and improving career decision making by the CHOICES program as measured by scores on the Assessment of Career Decision Making?
- (3) What effect does the CHOICES program have on undergraduate and graduate college students relative to eliminating barriers to their career decision making as measured by scores on the Career Decision Scale?
- (4) What effect does the CHOICES program have on undergraduate and graduate college students relative to career decision making as measured by scores on the Assessment of Career Decision Making?

Rationale For The Study

Vocational research has emphasized the area of career preference and vocational interest inventories (Holcomb and Anderson, 1977).

Although the reemphasis on career decision-making as a part of the career development process has been accepted by the counseling profession, research in this area is not complete (Devine, 1975). This research study will focus on career decision making of college students, a population under particular pressure to make a vocational choice (Devine, 1975; Beaumont, Cooper, and Stockard, 1978).

Computerized guidance, a relatively new professional intervention technique, when compared to traditional methods, such as individual and group counseling, has not been sufficiently evaluated by external researchers (Clyde, 1979). The research which has been done on computer-assisted guidance systems suffers from several weaknesses including heavy reliance on student questionnaires, evaluation of the particular system by its own developers, and the use of limited sample sizes (Clyde, 1979).

This study was conducted in a university setting by an external researcher using an external evaluation. The instruments used were the Career Decision Scale and the Assessment of Career Decision Making. A significant sample size of 136 students, who willingly participated in the CHOICES program, was selected. Because the study was conducted as a part of the normal operating conditions of a university cooperative education and placement center, its replicability to other university and college settings has been enhanced.

Additionally, this investigation will provide the counseling staff with data-based information on the level of career decision-making of its student population. The research results will provide a partial

evaluation of the CHOICES program as it is currently implemented in this counseling program.

Definition of Terms

The computerized guidance system used in this study is Computerized Heuristic Occupational and Career Exploration System (CHOICES), which was developed in Canada by the Department of Manpower and Immigration.

In this study, the following additional definitions will be used:

- (1) Career decision making--The complex process by which the individual evaluates, selects and commits to action, career alternatives.
- (2) Career development--The continuous, life-long process of the individual implementing his self-concept within the world of work. This process proceeds in a series of stages with the influence of one's abilities, aptitudes, behavior patterns, environment, interests, and values.
- (3) Computer Assisted Guidance (CAG)--The use of the computer to assist in the career development of an individual.
- (4) Undergraduate student--A college student enrolled in a university who has not received his bachelor's degree and is classified as either a freshman, sophomore, junior, or senior.
- (5) Graduate student--A college student enrolled in a university in a graduate program who has not received his graduate degree.
- (6) Career Guidance--"an organized program to help youth develop self understanding, learn about the world of work, gain experiences that will help in decision making, and find jobs" (Tolbert, 1974, p. 27).

Organization of the Study

The remainder of this study consists of four chapters and the appendices.

In Chapter II, a review of the related literature is found. An in-depth examination of the methodology in Chapter III includes null

hypotheses, the sampling procedures, the treatments, the research design and the instruments used as criteria. Chapter IV will contain the data and the data analyses with Chapter V, the final section discussing the results.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

The review of the related literature will be discussed in this chapter as follows: 1) career guidance in higher education, 2) theories of career development, 3) the Career Decision Scale (C.D.S.), 4) the use of computers in career counseling, and 5) CHOICES, a computerized guidance system.

Career Guidance in Higher Education

Career guidance in higher education is a result of the assumption that a need exists to assist students with their career development (Sampson, 1977). The existence of this need can be established on the basis of the following: (1) recent labor market and labor force changes, (2) current status of career development programs in higher education, and (3) research studies on career development.

Recent Labor Market and Labor Force Changes

Changes have taken place recently which have revised the dynamics and the composition of the labor market. Two major modern developments are the specialization of the technological society and the breaking of the lockstep of the past in which the individual followed a fixed sequence that regulated his schooling and his work history. As a result of these and other changes, a widespread waste of human talents exists with many college students unable to find a link between education and

occupational choice in spite of the pressure placed on them to make a career decision (Beaumont, Cooper and Stockard, 1978). Moni (1979) captured the spirit of our modern age stating that

We live in one of the most complex, technocratic and turbulent societies ever known. All segments of our society are undergoing rapid and extensive changes. Extensive developments in technology, economics, social structure, and values converge to create an ever changing and complex "world of work." (p. 1)

As a result of the specialization of our technological society, the individual faces an ever widening range of occupational choices and can no longer follow in the vocational footsteps of his parents (Blocher, 1973; Ginzberg, Ginsburg, Alexrad, and Herma, 1951). In the working life of an individual, occupations become established and then move into obsolescence (Cassie, 1976). With the ever-expanding array of choices, the complexity of the task of vocation decision making and career development has increased (Moni, 1980).

In our modern society, the lockstep sequence has been broken as elucidated by Wolfbein: "The lockstep sequence in which one grows up and goes to school, then goes to work, then retires is being broken" (1974, p. 11). The sequence which emerges is made up of a mixture of school and work with the individual's career patterns being redirected by education (Sampson, 1977). The past emphasis on one job for a lifetime no longer makes sense (Cassie, 1976) as the frequency of mid-career changes increase (Tolbert, 1974), and more women enter the labor market.

As a result of the maladjustment to the workplace, widespread waste of human talents exists (Beaumont, Cooper and Stockard, 1978). Rash or

inappropriate choices are made by individuals who do not give sufficient attention to the task of career decision making.

College students progress through their undergraduate years without making a career choice. The pursuit of a college degree becomes an end in itself for many students who do not establish a link between education and occupational choice (Ginzberg, Ginsburg, Axelrad, and Herma, 1951). The primary focus of the university is placed on assisting the student in achieving academically rather than on helping in the selection of a satisfactory occupation (Devine, 1975). This emphasis on academic achievement by higher education to the detriment of career development is a problem that the college student must face as he attempts to choose a career. This conflict between academic achievement and a meaningful career choice is explored by Korn (1968):

Freshmen arrive at college with widely divergent concepts of themselves, their talents, and their goals. Common to all is the hope of gaining an answer to the question of how to give meaning to their lives, and how to pursue an orderly path through a maze of contradictory pressures. Some students find meaning and order by narrowly defining what they want in terms of training for a career. Others are so diffused in their goals and have such complex problems of personal meaning to resolve, that their academic work is virtually isolated from their real lives. (p. 23)

Burck (1971), who also addressed the nature of the career development problem of college students, expressed views that are similar to those of Korn. Burck emphasized that the college student must choose from a vast array of occupations that are available in our technological society utilizing only very limited knowledge about specific occupations and little practical work experience. With this

combination of a lack of adequate knowledge and the pressure that the educational system exerts, the college student career choice frequently is not a deliberate decision but is made by default (Burck, 1971).

College students with clear career goals have a better chance of receiving the full benefit from their university education. Because these directed students can see the relevancy of their studies in meeting their personal career goals, better concentration on their studies can be anticipated (Beaumont, Cooper, Stockard, 1978). In comparison, the individuals without any career-related goals may experience an amorphous anxiety which does not enhance academic performance.

As Cassie states: "The business of career counseling is too important to be left to chance" (Cassie, 1976, p. 13). Society has become concerned with students who are not finding their college experience helpful in moving into meaningful occupational roles in society (English, 1974).

Current Status of Career Development Programs in Higher Education

Although the need for career counseling in higher education has been demonstrated and is a concern of society, the current career development programs are inadequate to meet the need of students (Borow, 1973; Devine, 1975; Zunker, 1981). According to Borow, there are seven contributive factors to this lack of adequacy: (1) limited time for career counseling, (2) overemphasis on making a specific career decision and underemphasis on total career development process, (3) assumption by the counselors of one career per lifetime, (4) overemphasis placed on

assessment through testing, (5) stressing of the job-related content of occupational options rather than the life stage or the psychosocial characteristics, (6) crisis counseling rather than developmental, and (7) limited number of evaluative research studies on the outcome resulting from career counseling.

Present day college and university counselors are inadequately prepared to deal with the career development of their students (Devine, 1975; Harris, 1974; Zunker, 1981). In graduate schools, counselors do not receive adequate training to prepare themselves for career counseling and are lacking in their knowledge of career development theory and in their ability to utilize techniques for facilitating career development (Devine, 1975; Graff and Raque, 1974; Zunker, 1981).

The status of career development programs in higher education is affected by the attitude of university counseling center professionals who often perceive career counseling as less interesting than personal counseling giving it a low priority (Devine, 1975; Graff and Raque, 1974). Discussing this problem of the vocational counseling field, Cross stated that ". . . subtle snobbery sometimes places a greater status on personal counseling" (1976, p. 1). This attitude of counselors is another contributive factor to the weakness of vocational counseling programs at college and university counseling centers (Beaumont, Cooper and Stockard, 1978).

The inadequacy of university counseling centers in the area of career development is partly a result of their resistance to utilizing innovative approaches. The traditional individual approach is utilized,

and outmoded theoretical perspectives are held by many university career counselors (Borow, 1973; Sampson, 1977). Since traditional methods have met with limited success, a need exists for counselors to experiment with new techniques to assist their students with career-related problems (Devine, 1975).

Computer assisted guidance is one of several new approaches that have been developed which can be incorporated into an university center counseling program (Devine, 1975). Some of the benefits that can be realized from a computer-assisted program will be discussed in a later section.

Research Studies on Career Development

Research studies support the need to assist college students with their career development. From the research that has been conducted, it is evident that a great number of students are in need of some type of help (Devine, 1975). The relevant research on career development is divided into the following three areas: (1) research on the nature of career choice by college students, (2) research indicating an expressed interest by students in more emphasis on career guidance and counseling, and (3) research on unstablized career patterns.

Nature of Career Choice. Research supports the lack of a career choice or the inconsistency of choice by college students. Myers (1972) reviewing several research studies stated that a number of these studies indicated that 20% of the entering college freshmen had not made a vocational choice. In a study of 36,000 students attending 246 institutions, Astin and Panos (1969) reported that after entering their

chosen school, three-fourths of the college students would change their career choices. In their sample, 18% of the college freshmen had not chosen a major. In another study on incoming freshmen, only 36% of the students had selected an academic major (Devine, 1974). A related research project indicated that 30% of the class of 1972 of Harvard University was without any career plans (Ginn, 1974).

A five-year longitudinal study of Stanford University's freshman class by Korn (1968) dealt with the nature and the consistency of vocational choices of students. Korn reported that "students are moving on to important career choices without a careful evaluation of what they want for themselves" (p. 230).

Katz, Korn, Leland and Levin (1969), who reviewed several research studies, suggested that the following common themes were found on career choice behavior:

- (1) significant numbers of college students make some shift in career direction between the first year of college and the year following college graduation, and
- (2) many students appear to move into career choices without adequate evaluation of either personal potential or career alternatives. (p. 159)

Express Student Interest in Career Development. In research studies, students have indicated an interest in receiving assistance with their career development. In a study by Bergeson, Roost and Phillips (1975), two-thirds of the university students who were interviewed indicated that sufficient emphasis was not placed on career preparation by their institution. In a survey of community college students to make a determination of their satisfaction with occupational

planning, 63% were either dissatisfied or fairly satisfied with a need for more planning (Wollman, 1973).

The College Entrance Examination Board (1970) surveyed the college bound students who took the Scholastic Aptitude Test during 1976-77 and 1977-78 school years. On the Student Descriptive Questionnaire which was the instrument used to gather the data, the students reported their plans for requesting special assistance at college. Of the seven choices offered on the questionnaire, educational/vocational counseling was chosen by 64% of the students in 1978 and 41% in 1977. Thus, receiving career and educational counseling was an expressed need by prospective college freshmen during both 1977 and 1978.

Unstabilized Career Patterns. Research indicates that a percentage of young adults have unstabilized career patterns or related career development problems. The Career Pattern Study was a comprehensive, longitudinal study of eighth and ninth grade male students that was carried out by Super and his associates. The career development of each man was studied at various intervals from fifteen to thirty-six. Their career development at age twenty-five provided the most meaningful data. The average student changed positions six times during a seven year period. Approximately one-half of the students at age twenty-five had not stabilized their career patterns since leaving school and one-third were floundering (Super, Knowalski and Gotkin, 1967).

A similar longitudinal study was conducted by Gribbons and Lohnes (1969) which examined the career development from adolescence to

adulthood of both men and women. The research results reports that a large percentage of adolescents are not successfully dealing with the tasks required for adequate career development. At the age of 25, one-third to almost one-half have career development problems.

The need for career guidance in higher education is supported by research dealing with the nature of career choice of college students, expressed interest by students for more career counseling, and research on unstabilized career patterns. The recent labor market changes with increased specialization, breaking of the lockstep, and widespread waste of human talents have resulted in an increasing need for career development programs.

The counseling profession has not responded to the need for career development in higher education with adequate programs. Although the total education system holds the responsibility for many of the criticisms regarding the poor career development of its students, the guidance profession needs to accept a part of the responsibility and to respond by the development of innovative and improved programs (Tolbert, 1974).

Theories of Career Development

Theories of career development are presented in order to provide a theoretical rationale for the origin and the need for computer-assisted guidance systems. Without the existence of a sound theoretical base, computerized-guidance systems would not have developed and would not have become incorporated into career guidance (De Cristoforo, 1980; Johnston, 1981).

Major theories of career development are categorized by Amatea (1975) in terms of the following dual perspectives:

- (1) those theories which emphasize the specification of factors or processes at work during the time of the career choice event, or
- (2) those theories which emphasize the lifelong nature of a cumulative career choice process. (p. 18)

Essentially, the different perspectives provide two distinct answers to the basic questions on the nature of the career choice process. The first approach basically conceptualizes the career choice process as a "point-in-time-event" with Anne Roe and John Holland representing this major theory of career development. In contrast to this viewpoint, Ginzberg, Super, Blau and associates emphasize the developmental process or "the long term sequence of events influenced by factors which operate over the lifetime of the individual" (Amatea, 1975, p. 19).

The work of Frank Parsons was the basis for the trait and factor theory of occupational choice which is the most venerable theory of career guidance (Amatea, 1975). According to Parsons (1909), the wise vocational choice involved three critical factors: (1) understanding of self, (2) occupational knowledge, and (3) true reasoning on the relationship between the two factors. The trait and factor theory held as its major tenet the assumption that "a straightforward matching of an individual's abilities and interests with the world's vocational opportunity can be accomplished" (Amatea, 1975, p. 19). Thus, a critical characteristic of this approach is the matching of objective data on the individual with information relating to the occupational requirements of the world of work (Hewer, 1963). This practical approach to the occupational choice was the essential framework that

encouraged the development and utilization of occupational information by counselors (Zaccaria, 1970).

Ginzberg, Ginsburg, Alexrad, and Herma (1951) were early leaders who first published a theory that speculated about the career choice as a developmental process. The three main phases that they identified were fantasy, tentative and realistic. Although Ginzberg and his associates' early work in 1951 conceptualized the occupational choice as a largely irreversible decision that was made in the early or middle twenties, they later revised this position. As Ginzberg studied the vocational development of different groups, he refined his original theory and proposed that early choices are reversible and that occupational choice remains open-ended throughout a person's life (Ginzberg, 1972). Although Ginzberg's theory can assist counselors in planning career guidance programs, it is less applicable for designing specific interventions to assist the individual client than are the theories of Super and his associates (Amatea, 1975).

Super (1953, 1957, 1963) has been a major spokesman for the developmental approach to career guidance which emphasizes the process and not the specific choice building on Ginzberg's approach. Super made the following expansions:

- (1) the focus of examination by emphasizing the need to examine the career pattern of the individual versus the initial occupational selection of the individuals, and (2) the range of factors affecting the development process, e.g. the self-concept. (Amatea, 1975, p. 28)

A basic tenet of Super's comprehensive theory of career development is that the individual seeks to implement his self-concept during the career choice process.

To summarize, theorists of career development have viewed the career choice process from two perspectives which are very different. The career choice of an individual is seen as a single event or it has been perceived as one event in a long chain of events which are a part of a pattern of development. The developmental theorist such as Super have provided direction in the implementation of long-term programs. However, point in time theories hold major implications for career counselors (Amatea, 1975). Specifically although all computer assisted guidance systems use some elements from both major perspectives on career development, the trait and factor theory has had an important influence on all of these systems (Johnston, 1981).

Although a part to some extent of all theories of career development, certain theories such as those developed by Gelatt (1962) and Hilton (1962) have as their primary focus the process of decision making (Moni, 1979). Decision making is defined as a "complex process by which alternatives are evaluated, selected, and committed to action by an individual" (Campbell, 1978, p. 93). In decision theories, development is conceptualized as a series of choices with each decision having an effect on future decisions (Tolbert, 1974). Decision making is a continuous process which continues during the lifetime of the individual (Zunker, 1981).

The generation of conceptual models of decision making has been carried out by theorists such as Gelatt. The Gelatt decision making model which has practical applicability provides a framework that generates techniques and methods that are useful in the development of career counseling programs. Gelatt describes the process of decision making in terms of a cyclical process in which the focus is placed on the utilization of information and the perceptions of reward during the succession of choices. The following steps are included in Gelatt's model as described by Tolbert (1974):

- (1) Purpose of objective.
- (2) Collection of data.
- (3) Utilization of the data. In the first step, the predictive system is utilized to generate possible alternative actions with their respective outcomes. In step two, the probability and desirability of the outcome is weighed using the value system. Step three involves the evaluation and selection of a decision.
- (4) Decision. The decision is either terminal or investigatory (non-final).

Like Gelatt, Katz (1963) is an advocate of a prescriptive model of decision-making which prescribes the sequential steps that assist counselors in making better decisions (Campbell, 1978). Emphasizing the importance of values, Katz views them as the entry ground for decision-making relating closely to probable outcomes. Tolbert (1974) describing Katz states:

Katz (1963 and 1966) has specified the choice points in school that require decisions; emphasized the importance of the value system as the synthesizer of perceptions, needs and goals in vocational choices; and described a model combining the three systems used by the individual--an information system, a value system and a prediction system. The exploration of choices begins with values. (p. 68)

In a similar approach which has been advanced by Hilton (1962), he conceptualizes the major motivator of career decision making as "the reduction of dissonance among individuals' beliefs about themselves and their environments" (Moni, 1979, p. 14).

While placing a value on career decision making, MacKay (1975) and Gaymer (1972) have been critical of the emphasis that is placed on this topic by career counselors. According to MacKay's perspective, this emphasis promotes premature permanent career decisions by students. Gaymer's views this focus on decision making as pressuring youth into quick decision while confronting them with a confusing array of occupational alternatives. When young people are unsure or hesitant, Gaymer (1972) states that they are made "to feel like second-class citizens, guilty of the 'crime' of not wanting to change or of having not yet been able to make a decision" (p. 20).

To conclude, the importance of career decision making is recognized by all theories of career development. However, the different theorists disagree on its place in the process and the amount of emphasis that should be given to career decision making (Moni, 1979).

In the conclusion to this section on the theories of career development, the current theories and models of career guidance can be

compared to the theories of natural sciences. When compared to the rigorous criteria of natural science theories, the current theories and models of career development can be viewed as lacking (Bailey and Stadt, 1973). However, in spite of their weaknesses, these models are useful to practitioners in designing programs and to researchers for developing testable hypotheses. "The issue is not to accept the theories, but rather how to apply knowledge of the theories to the solution of classroom and guidance problems" (Bailey and Stadt, 1973, p. 93).

Career Decision Scale

Since all theories of career development recognize in some way the importance of decision making, its existence as a central construct of career development is recognized (Tolbert, 1978; Bowlsbey and Rayman, 1980). However, in spite of its widespread acceptance as an important construct of career development, difficulty has been experienced by researchers in its measurement (Oliver, 1978). The Career Decision Scale (C.D.S.) which was developed by Osipow, Carney, Winer, Yanico and Koschier in 1976 has demonstrated that it is a useful measurement of career decision making (Slaney and Palko-Nonemaker, 1981). Discussing the Career Decision Scale and the Vocational Decision Making Difficulty Scale, Slaney and Palko-Nonemaker (1981) state:

Certainly both scales seem promising as ways of more effectively measuring career indecision, selecting vocational treatments, and conducting research on the effects of such treatments. The issues are of central importance to vocational psychology and future research on both scales seem potentially productive at this point. (p. 102)

The following aspects of the Career Decision Scale will be discussed: (1) rationale, (2) composition, (3) administration, (4) reliability, (5) validity, and (6) norming. Since its publication, studies have been conducted with the C.D.S. by researchers concerned with career decision and indecision.

The Career Decision Scale's rationale is based on the assumption that "a finite number of relatively discrete circumstances are responsible for problems people have in reaching appropriate closure and in the implementation of educational and vocational decisions" (Osipow and Waddell, 1980, p. 1). In an attempt to identify these barriers, a list of sixteen descriptions of antecedents for career indecision have been generated. Additional items that were later added included two items indicating career certainty and a final item which is unscorable and open-ended. This final item provides the respondent with the opportunity to list other barriers which were not represented in the items on the scale.

In order to determine the composition on the Career Development Scale, a factor analysis was computed to identify subscales (Osipow, Carney and Barak, 1976). On a sample of 837 students, the following factors emerged which explained more than 81% of the total variance: (1) choice anxiety leading to vocational indecision, (2) external barriers to a preferred choice, (3) approach-approach problems, and (4) personal conflict. Several other researchers have replicated the factor analysis on the Career Decision Scale (Kazin, 1976; Slaney, 1978; Slaney and Palko-Nonemaker, 1981). On the first three factors, Kazin (1976)

had similar results to those of Osipow et al. in his 1976 study. The factors are unreliable across the various studies, and scoring of them is not recommended for clinical use (Osipow and Waddell, 1980).

The administration of the C.D.S. is simple with instructions that are easily understood by the student. The respondent has a choice of one of four response categories to answer the eighteen statements. The response category "four" indicates that there is a considerable amount of similarity between the student and the item while category "one" is an indication of a considerable difference. The eighteen statements deal with the certainty of career choice and/or the reason that the uncertainty accurately describes the student. Most individuals who have adequate reading skills should complete the Career Decision Scale within 10 to 15 minutes with many people requiring less time.

Three reliability studies assessed the test-retest reliability of the C.D.S (Osipow, Carney, Barak; 1976; Slaney and Palko-Nonemaker, 1981). In his two studies, Osipow et al. used two week intervals between testing while Slaney and Palko-Nonemaker retested after six weeks. A high test-retest reliability for the scale as a whole was indicated by Osipow, Carney, Barak with 0.902 for one study and 0.819 for the other research project. Over a two week period, the majority of the item test-retest correlations fell into the 0.60 to 0.70 range. Slaney and Palko-Nonemaker found lower reliability scores on individual items with overall test-retest reliability for the combined items of .70.

Research on the Validity

Studies on the Career Decision Scale have demonstrated its validity indicating that this instrument measures relevant changes following counseling interventions that were designed to reduce career indecision for groups of high school and college students. Research has investigated the relationship of the instrument to other measures of career development.

Osipow, Carney, Barak (1976) in an early series of studies examined the sensitivity of the C.D.S. to a variety of counseling interventions. The positive results indicated the potential responsiveness of the instrument to changes resulting from treatment to reduce indecision. In 1979, Taylor studied the effects of a residential career exploration program on the career indecision of college students. The results testify to the construct validity of the Career Decision Scale.

In a similar study, Sutera (1977) gauged the impact of a residential career planning program for students in a co-educational living setting. Other instruments used by Sutera included the following: (1) the Attitude Scale of Career Maturity Inventory (Crites, 1973) and (2) Barak, Carney and Archibald's (1975) adaptation of Aiken and Johnston's Measure of Information Seeking (1973). The Career Decision Scale's score reflected greater decision following the sixteen week treatment than did the scores on the other two instruments.

Carney (1977a) conducted research utilizing a career exploration class in which the class content was similar to that of Sutera's (1977) study with the exception that the students did not reside in common

housing and with a shortening of the length of the course. Positive results indicated that the Career Decision Scale was responsive to changes in the students as a result of the intervention. The Assessment of Career Decision Making (Harren, 1976), which was also used, indicated stronger commitment to a major and an occupation by the students.

In a nine-hour career development workshop conducted at the University of Utah, the Career Development Scale was utilized as a pre-post treatment measure by Carney (1976). The results were positive indicating greater decision showing the C.D.S. to be sensitive as a pre-post measurement.

Cranston (1978) investigated the effects of volunteer experience on career decidedness, autonomy, and self-concept of college students. Participation in the volunteer program was found to have an effect on career decidedness. In their study of freshmen planning to major in education, Halasz-Salster and Osipow (1978) were unable to reach any conclusion using the Career Decision Scale in their research project due to the restricted variance of the indecision of the students.

Rubenstein (1978) studied the effects of using different interpretative methods when counseling students concerning their vocational inventories. According to his findings, the Career Decision Scale was the only criterion measure that indicated a significant interaction effect between the interpretative methods and the counselors. No significant effects were revealed with the Strong-Campbell Interest Inventory (SCII) and the Crites Career Maturity Inventory (CMI).

Cellini (1978) hypothesized that high levels of indecision as measured by the Career Decision Scale would be associated with external locus of control. The hypothesis was supported by the results of the research. In a similar study, Taylor (1979) found that vocational indecision, fear of success, and locus of control were all positively related.

Niece and Bradley (1979) studied the connection between "age" differences, which were inferred from grade level, and the Career Decision Scale. Using a high school population, "older" students were found to show greater decidedness.

Jones (1978), utilizing a sample of college students enrolled in a career choice course, found that there was no relationship between the antecedents of vocational indecision as measured by the Career Decision Scale and cognitive developmental stages of career development. The KNETZA, a semi-projective written instrument was used to measure the cognitive developmental stages.

Slaney (1980) provided additional construct validity through his research on college students in which they were administered the C.D.S. and the Occupational Alternatives Question. His research showed that the C.D.S. differentiated subjects with a first choice, from those with a first choice plus alternatives, and that it was also able to differentiate both of these groups from those with no first choice.

In other studies, the Career Decision Scale has been correlated with other instruments. Westbrook, Simonson, and Arcia (1978) found that the CMI Attitude Scale was correlated with the Career Decision

Scale. Exploring concurrent validity with respect to Harren's (1976) Assessment of Career Decision Making (ACDM), Osipow and Schweikert (1979) found a significant correlation existed between the two scales. Lange (1980) indicated that a significant inverse relationship existed between the Career Maturity Inventory and the Career Decision Scale during a replication study. Westbrook (1980) studied the correlation of the Career Decision Scale with scholastic aptitude measures and instruments that measure career maturity.

Norms

Norms are available on the Career Decision Scale on undecided college freshmen, college students, and high school students. To develop these norms, a sample of college students was tested at different year levels and in different fields of study.

To conclude, the evidence from the research on the Career Decision Scale indicates that it is a useful measurement of career indecision and that it is an effective instrument for conducting research on the effectiveness of intervention to promote career decision making (Slaney and Palko-Nonemaker, 1981). Additional research on the utilization of the Career Decision Scales which has not been discussed includes the following: Hartman, 1980; Jones, 1979; Lange, 1980; Limburg, 1980; Rogers, 1980; and Westbrook, Cutts and Simonson, 1980.

The Assessment of Career Decision Making

The Assessment of Career Decision Making (ACDM), a self-administered and self-scored questionnaire, was developed for use with high school, college, and adult populations. The ACDM which is composed of a

set of four scales can be administered in its entirety or separately depending upon the needs of the user. The four scales of the ACDM are the following: (a) Decision Making Styles Scale--determines which of three decision making styles the individual primarily utilizes when making important life decisions; (b) the College Scale--the degree of satisfaction with the college that the student is currently attending; (c) the Major Scale--the degree of commitment that is felt towards the choice of a major field of study by the individual; and (d) the Occupation Scale--the degree of commitment and certainty to one's choice of a future occupation (Harren, 1980).

The Assessment of Career Decision Making is based on Harren's Career Decision Making Model (1979a). The Vocational Decision Making Q-Sort (Harren, 1966) was the original instrument which Harren constructed in order to test the decision making paradigm of Tiedeman and O'Hara (1963).

The decision making task-occupation (DMT-O) and the decision making task-major scales (DMT-M) were designed, to provide an assessment of progress through the initial planning stages which are described in Harren's Career Decision Making Model as exploration, crystallization, choice, and clarification (Buck, 1981). The decision making task college (DMT-C) scale makes an assessment of the individual's progress relative to the implementation of the stages of induction, reformation, and integration. On these decision making task scales, the higher the score the more advanced the student is in the decision making process.

The ACDM decision making style scale is composed of subscales which determine the degree to which the individual relies upon each of three distinct decision making styles: rational, intuitive, and dependent. The subscales make a determination of the degree to which the individual accepts personal responsibility for his own decisions as opposed to projecting of this responsibility outside of himself to outside sources such as fate and other people. Second, the decision making style scale assesses the degree to which the individual utilizes logical versus emotional strategies while making decisions (Harren, 1980).

The ACDM was designed to be utilized by both the practitioner and the researcher in vocational psychology and career development. The four purposes of using the ACDM are described by Harren (1980) as the following:

- 1) individual or group assessment and counseling; 2) class-room instruction in effective career decision making; 3) needs assessment, program development and evaluation; and,
- 4) research in career decision making. (p. 2)

ACDM - Occupation Scale (ACDM-O)

For the purpose of this research project, the occupation decision making scale was utilized. This scale makes an assessment of the degree of commitment or lack of it that the individual feels towards the chosen future occupation. This twenty item scale is representative of a single, bi-polar continuum with a negative and positive pole. The negative pole is described by Harren (1980) as

characterized by an awareness of the need to decide; recognition of the need for exploratory courses; concern about lack of ability, changing and undifferentiated interests; and no systematic strategy. . . . (p. 4)

On the other side of the scale, "the positive scale is characterized by commitment, relief, involvement, a sense of direction, certainty, and an unswerving attitude towards carrying out one's commitment" (Harren, 1980, p. 4).

Research on the ACDM

Reliability. Research on the ACDM has dealt with its reliability and its validity. In order to establish an estimation of the test-retest reliability of the ACDM, 73 undergraduates were administered this instrument during a two-week interval. The test-retest reliability for the decision-making task scales was the following: (1) DMT-C scale = 0.80; (2) DMT-M scale = 0.84; and (3) DMT-O scale = 0.83. On the decision-making styles scales, the test-retest reliabilities were as follows: (1) rational = 0.85; (2) intuitive = 0.76; and the dependent = 0.85. Thus, the research indicates that the stability of the ACDM scales are satisfactory (Harren, 1976b; Harren, Kass, Tinsley, and Moreland, 1978).

Validity. Research on the ACDM and on the Vocational Decision-Making Checklist which was its predecessor demonstrated its construct validity and supported its use as a research instrument (Harren, Kass, Tinsley, and Moreland, 1978). A number of studies have utilized the ACDM to evaluate the effectiveness of various career counseling or instructional intervention (Berman, Gelso, Greenfeig, and Hirsch, 1977; Cochran, Hoffman, Strand, and Warren, 1977; Evans and Rector, 1978; Smith and Evans, 1973; Wachowiak, 1972).

Smith and Evans (1973) demonstrated the construct validity of the Vocational Decision Checklist through a comparison of an experimental groups guidance course and individual counseling. On the subscales, the experimental group scored higher than the individual counseling group. The individual counseling group had a higher score than the no-treatment control group.

Cochran, Hoffman, Strand, and Warren, (1977) studied the effects of client/ computer interaction on the career decision-making process. The treatment was a three hour interaction with the System of Interactive Guidance Information (SIGI). Utilizing the Vocational Decision-Making Checklist, a positive change was found for the treatment group on the college major scale. However, no significant changes were found in pre-post decision-making measures relative to occupation.

To conclude, the ACDM is a valuable instrument that has established reliability and validity. In the Annual Review of Psychology, Holland, Magoon, and Spokane (1981) stated the following:

The most comprehensive theoretically oriented scheme to appear in 1978-1979 is Harren's (1978) Assessment of Career Decision Making (ACDM), which implements Tiedeman's speculations (Tiedeman and O'Hara, 1963) about the stages in decision making: exploration, crystallization, choice, and clarification. The ACDM has attracted more positive research than any other diagnostic scheme (Evans and Rector, 1978; Harren et. al., 1978; Moreland et. al., 1979). (p. 286)

The Use of Computers in Career Counseling

The prediction has been made that the use of computers in guidance programs would become one of the most powerful career counseling tools of the future (Harris, 1974). What is computer-assisted guidance? According to Campbell (1978), "computer-based guidance can be defined as

the use of computer, either off-line or on-line, as a tool to deliver some part(s) of a systematic guidance program" (p.191). On-line refers to the direct communication between the user and the computer typically through a telephone line or a cable. The user has a direct control over the interactions that are taking place with the computerized guidance system. With the off-line method, no direct communication exists between the student and the computer. Instead, a questionnaire or form which is completed by the user is processed by the computer. The user later receives the results of his indirect contact with the computer.

Historical Background of Computer Guidance Systems

Computers have long assisted counselors with record-keeping and data-processing needs. In the 1960's, developmental projects which had as their purpose the direct use of computers to assist with career counseling and guidance first gained prominence. From 1966 to 1970, a floating symposium was hosted at their respective sites by the following organizations and schools who were involved in the pioneer development of computerized guidance systems: Ohio State University, Systems Development Corporation, International Business Machines, American Institutes for Research, Harvard University, Willowbrook High School, and the Educational Testing Service. At these conferences, Robert Campbell of Ohio State University was the permanent secretary with the chairmanship being held at different times by the following individuals: David Tiedeman, John Cogswell, Frank Minor, John Flanagan, JoAnn Harris, and Martin Katz. At these symposiums, the host organizations would demonstrate the developmental work being done on their particular

computer-assisted guidance system. Thus, a spirit of cooperation between developers characterized the early history of computerized guidance (Katz and Shatkin, 1980).

While computer-assisted guidance systems were being developed by various individual developers, at the national level the awareness of the need for a national career information system was emerging. The need for improved career planning had become apparent as a result of the labor market imbalances and the economic problems of the 1970's (Clyde, 1979). The National Occupational Information Coordinating Committee (NOICC) and the State Occupational Information Coordinating Committees (SOICC) were established as a result of the passage of the following amendments and acts: (a) Educational Amendments of 1976 and the subsequent legislature of the Youth Employment and Demonstration Project Act (YEDPA) of 1977, (b) the Career Education Incentive Act of 1977, and (c) the Comprehensive Employment Act (CETA) Amendments of 1978 (Snipes, & McDaniels, 1981).

The establishment of the National Occupational Information Coordinating Committee (NOICC) promoted the development of a national/state system that would coordinate the development and the delivery of occupational information. An interagency agreement between the Employment and Training Administration (ETA), the Bureau of Labor Statistics, the U.S. Office of Education, and the National Center for Educational Statistics was an important part of this process. In addition to improving the quality of data used for vocational counseling and education, NOICC and the state committees (SOICC's) had as their

mandate the development and the implementation of Occupational Information System (OIS). The immediate objective of the OIS was the provision of occupational and career information to user groups. The long-term objective was the development of a system which had improved and expanded capacities to meet the needs of the user populations. These objectives had the effect of promoting the development of computerized guidance systems. With the availability of federal and state funding, commercial vendors entered the emerging market for computerized guidance programs (Snipes & McDaniel, 1981; Clyde, 1979).

To conclude, the development of computerized guidance program started more than a decade ago with the efforts of pioneers who were situated in a dozen locations. The urgent need for a system to transmit vocational and career information which was both accurate and comprehensive was the force that was propelling this movement. The selection of computer based systems to meet this need was a logical development due to the unique capacities of the computer (Harris, 1972; Clyde, 1979).

Problems and Drawbacks of Computers in Counseling

Many of the problems associated with computer-assisted guidance programs today are the same as those discussed by Super in his 1970 book entitled Computer Assisted Counseling. A partial explanation for this phenomenon is that the major problem associated with these sophisticated systems is the rapid change of technology versus society's slow ability to accommodate to it.

The counselor, who is a part of society and reflects its problems, experiences difficulty at times in accepting the new technology of

computer-assisted guidance. Although the decisions concerning the adoption of a new system are typically made by the administrators and not primarily by the counselors, their enthusiastic acceptance of this innovation will be essential in order to insure its success (Myers, 1970). Super (1970) identified sources of resistance by counselors which are still meaningful over a decade later. They include the following:

1. The counselor's non-mathematical orientation in juxtaposition to the computer's complexity.
2. The computer's accuracy in contrast to the counselor's fallability.
3. The possibility that the computer will diminish the counselor's autonomy in scheduling his own time.
4. The computer system's apparent deterministic character. (p.113)

Fear of displacement by the computer is a concern that has been expressed by some counselors. Harris (1970) suggested that more counselors will be needed as the result of computer-assisted guidance programs since students will have more available information to utilize in making decisions. Thus, students will make decisions that are informed and which will more likely result in career satisfaction. By providing the information needed by the students, computers will provide relief to the counselor from "clerical and information retrieval functions which now require so much of his time and provide time for more in-depth counseling". (Harris, 1970, p.164)

As a result of the benefits that the counselor receives from the computer, the resistance to this new innovation is not typically expressed by a counselor who is currently utilizing a system. In the concrete, the computerized guidance system is accepted by the counselor.

Instead the resistance according to Super (1970) is "the product of theory or of abstractions--one might say, of stereotyping" (p.124).

Adequate training of counselors is one method of dealing with the problem of acceptance. In order to utilize the systems effectively and reduce resistance, adequate training is essential. Although the majority of systems have produced counselor manuals and handbooks, some do not have adequate programs for staff development. Initial and periodic training sessions for counselor and other staff members which include strategies for the implementation and operation of the system are an essential component to a successful computer-assisted program. Second, the counselor educators in the universities can prepare their students to utilize these tools by the inclusion in the curriculum of both hands-on and theoretical training in this important innovation (Clyde, 1979).

Financial Support

Financial support of the computer-assisted guidance system is a question that is much more complex than is the issue of acceptance by the counselor and by the public (Super, 1970). The value of standard expenditures, such as laboratory equipment and counselor salaries, has been well-established. With innovations, their value must be demonstrated in order to receive adequate funding.

The cost of the implementation and maintenance of a computer-assisted guidance program can be considerable. With a system such as SIGI, a large initial outlay (approximately \$75,000) for the equipment may be required (Devine, 1975). With other systems such as CHOICES,

only a monthly maintenance fee is needed since the hardware and software are leased rather than purchased.

In order to deal with the problem of financial backing and cost, there is a need for big business, with its marketing and support capacities, to become involved in computer assisted counseling. Through competition between businesses, the price of these systems would decline, especially with the anticipated use of microcomputers. Systems typically have been developed by small educator teams whose major interest was research and development. After the completion of the computer assisted guidance system, it was made available to the non-profit educational operations or placed in the public domain. The difficulty with this option was the financial struggle that the nonprofit agency faced during the first two or three years of needed orientation before it could implement the system. No available organization existed to handle all of the administrative responsibilities involved with the implementation and maintenance of a system (Campbell, 1978). Faced with these difficulties, the entry of big business into computer assisted guidance, with its potential for large scale marketing, is the preferred option that would insure the future of this innovation in the face of government cuts in expenditures (Campbell, 1978). In Canada, CHOICES is currently being marketed by a private profit company called the Canadian Systems Group.

Another problem that all computer assisted programs must deal with is their application to populations of handicapped, minorities, or English as a second language. In the area of serving the handicapped,

CHOICES has responded to their needs by the inclusion of a section which asks the counselee about his potential to perform the basic physical functions required by the occupation such as speaking, sitting, and hearing. Partly for this reason, CHOICES is now utilized by a number of the offices of the Division of Vocational Rehabilitation in the State of Florida. Thus, the ability of a computer assisted guidance system to respond to different populations will effect its ability to be widely marketed.

The question of information quality is another problem that computerized guidance programs must deal with on an ongoing basis. System developers have reported their needs for improved sources of occupational and educational data. Second, a standard needs to be set that would provide a guideline to determine acceptable quality in the information files of a computer assisted guidance system. NOICC and SOICC have started to deal with these important issues (Clyde, 1979).

Benefits of Computer Assisted Guidance Systems

Although problems and some drawbacks are associated with these sophisticated systems, the benefits that are received outweigh all other considerations. The existence of a computerized system promotes the coordination of various agencies and organizations to provide a statewide career information delivery system (Snipes and McDaniels, 1981). This has a far-reaching effect on guidance programs which have had difficulty acquiring accurate up-to-date occupational information.

"Computers are capable of performing some guidance functions better than humans" (Campbell, 1978, p. 194). Vast amounts of data can be

stored and retrieved quickly by the computer. Through data files, the information in the computer can be immediately updated. This computer capacity has a great value to counselors who have a need for up-to-date occupational information to assist students with realistic decision making. The ability of the computer to perform all of its operations at very high speeds far exceeds the ability of any human being (Sampson, 1977).

Harris and Tiedeman (1974, p. 2) suggest the following computer capacities that have a high potential value in career decision making:

- (1) The capacity to store, instantaneously retrieve, and update masses of data.
- (2) The capacity to interrelate data about the person and the environment so that both are relevant to the user at the time of his decision making.
- (3) The capacity to sort through masses of data, and on the basis of this data, provide a personally tailored list of educational or vocational options upon command.
- (4) The capacity to simulate a conversation or structured interview by using phone lines and interactive terminal devices, such as typewriter terminals or cathode ray tubes.
- (5) The capacity to monitor use of the system in order to provide feedback, review, and personalized assistance to a counselor or to the client himself.
- (6) The capacity to control and coordinate audio and visual material with text.
- (7) The capacity to provide an individualized package of services to many users simultaneously, for many hours each day, and in a wide variety of settings.

The high appeal of computerized guidance systems to the student population is an important benefit received from the addition of computers to a guidance program (Campbell, 1978). Computer assisted guidance has received enthusiastic student endorsement and interest (English, 1974). Although counselors initially feared that computers might be dehumanizing, Harris (1974) states the following:

Students do not indicate any feeling of dehumanization and, in fact, more often tend to view a session at the computer terminal as personal. (p. 335)

The ability of the computer to remember personal information about the client such as his name, interests, and abilities may lead the client to view the system as having personal qualities (Turgeon, 1979).

Computers are a cost effective method of delivering career guidance services (Campbell, 1978). With the current counselor-student ratio, adequate guidance systems cannot be provided to meet the needs of the student population. With society's present desire to cut governmental expenses, the future does not look encouraging in this regard. With the cost of counselor assistance currently averaging at least \$13.00 per hour, the computerized guidance system with its average cost varying between \$2.00 and \$5.00 per hour is cost efficient (Campbell, 1978). Based on the need to provide cost-efficient service, Campbell (1978) recommends the following:

It is, therefore, mandatory that the profession identify those guidance functions which must be done by counselor on a one-to-one basis and those which can be effectively performed by a computer. . . .(p. 194)

CHOICES, A Computerized Guidance System

History of CHOICES

CHOICES was developed in Canada by the Department of Manpower and Immigration whose research involved forty-five to fifty person-years of effort in the computer field (Ruane, 1979). In Canada, this computerized guidance system was piloted throughout the country with 312 terminals implemented in 1979, and with a projected growth of 1,350 sites.

In Florida, the history of CHOICES began with the exposure of the Center for Career Development Services of the Division of Vocational Education in Tallahassee to this computerized guidance system at a Department of Labor Conference in Washington. At this conference, a presentation was made by Phillip Jarvis who was the project director and developer of the system in Canada. The result of the evaluation by a task force from the State of Florida's Division of Vocational Education and the Division of Public Schools in April 1978 was positive recommending the implementation of CHOICES in Florida. In 1978, the negotiations began between the Deputy Minister of the Canadian Commission of Education and the office of Florida's Commission of Education for exchanging Florida research on Vital Information for Education and Work (VIEW) for CHOICES. In August, 1978, the CHOICES system in Florida was officially implemented with the completion of the international exchange (Ruane, 1979; Goldberg, Reardon, and Bonnell, 1980).

The Center for Career Development Services (formerly known as Florida VIEW), which has continued to carry the responsibility for CHOICES, has promoted this computerized guidance system throughout Florida. The system has been utilized in a variety of settings in Florida including universities, community colleges, state employment offices, and vocational rehabilitation offices.

Objectives of CHOICES

CHOICES was developed in Canada to assist individuals in making decisions with respect to relating their personal development to the

world of work (Cassery, 1978). Formal objectives which CHOICES addresses are the following:

1. Clarification of employment problems.
2. Promotion of self-understanding in terms of aptitudes, interests, aspirations, and other vocationally related characteristics.
3. Relating of self-understanding to the world of work.
4. Identify and assess a number of alternative solutions to employment problems.
5. Selection and commitment to a plan of action to overcome difficulties and secure satisfying employment. (Department of Manpower and Immigration, 1976)

The Department of Manpower and Immigration developed CHOICES in order to meet the above objectives as a result of a need to address several basic realities relating to career development in Canada.

According to a Canadian proposal written to support CHOICES,

career decisions are too frequently made without even a marginal knowledge of the labor market, the universe of occupations, and available training possibilities. . . .(2) New information essential to effective career decision-making is needed, and much information that is currently available is underutilized. . . .(Department of Manpower and Immigration, 1976, p. 6).

This same assessment of the state of career development and vocational information has been made in the United States by the National Occupational Information Coordinating Committee (Clyde, 1979).

CHOICES, in order to deal with this problem, "closes the communication gap between the facts and those who need to use those facts for effective occupational and career decision-making" (Department of Manpower and Immigration, 1976, p. 2). While utilizing

CHOICES, the counselee can directly interact with the available vocational information. The results of the career decisions that the client makes are immediately available and can be compared to the results of other possible career choices. The client has complete control of the decision making process and can change his choices at any point during the process of interaction with this computerized guidance system (Department of Manpower and Immigration, 1976; Florida Research Center, 1979).

This system which has a rapid response to input contains a comprehensive bank of career information to assist the client in his decision-making. The counselee has exposure to a broader range of occupational alternatives than would be feasible through traditional methods of career counseling. Florida CHOICES contains approximately 1,000 occupations which are cross referenced to an additional 3,000 occupations.

Utilization of CHOICES

CHOICES was designed to be utilized within the context of a high degree of counselor intervention. Without the intervention of a counselor, the Department of Manpower and Immigration was concerned that the counselees might rely too heavily on the output that was generated by this computerized guidance system. It was emphasized that the output of the computer was dependent upon the input of the clients. According to the Department of Manpower and Immigration, counselor's mediation would help to improve both the appropriateness of input and realistic evaluation of output. (Department of Manpower and Immigration, 1976)

Research supporting the importance of counselor intervention was provided by Sampson (1977) who stated in the conclusion to his dissertation that "Counselors again appear to be a necessary component of a computer-assisted guidance program "(p. 88).

Unlike other computerized guidance systems such as SIGI, the counselees cannot turn on the computer and utilize it without the assistance of a counselor. Specific counseling strategies have been devised and are strongly suggested to the counselor in the CHOICES Counselor Manual (Florida Center for Career Development Services, 1981). Prior to the counselees' interaction with CHOICES, the counselor should determine the clients' suitability for using the system and introduce them to its optimal and proper use. When it is necessary, the clients' anxiety relative to the utilization of a computer should be reduced. While the counselees make use of the system, a counselor or a counselor's aide should be available to answer questions and assist with any difficulties. A final interview is suggested after the utilization of CHOICES during which time the printout is discussed and a follow-up plan is developed by the clients (Florida Center for Career Development Services, 1981).

CHOICES, as developed by the Department of Manpower and Immigration, has both an occupational and an educational institutions data bank. In Florida, the Center for Career Development Services is currently modifying the educational institution file with American data. In 1983, this data bank should be available to users. The computer system is designed for the accessibility of the data bank through one or

more of the following paths which are called Routes: EXPLORE, SPECIFIC, COMPARE, and RELATED. During EXPLORE, the computer will suggest a number of jobs to the clients that satisfy the criteria which the users have specified during a question and answer sort through the occupational file. SPECIFIC provides a complete listing of information on any of the approximately 1,000 occupations contained in the data bank. COMPARE in a two or three column arrangement gives information about either two or three occupations simultaneously. RELATED selects occupations related to a job that is suggested by the client. A final route of CHOICES, JOB BANK provides a daily updated listing of currently available jobs in Florida which have been listed with the Florida State Employment Offices (Florida Center for Career Development Services, 1981).

EXPLORE. This is the route which will most benefit students who are unsure of their career goals and are searching for realistic occupational alternatives. EXPLORE requires that clients make specific decisions relative to their career priorities and their likes/dislikes. Initially, EXPLORE requires clients to prioritize the following topics which are available in this route and also used in the other routes:

- (1) interests
- (2) aptitudes
- (3) temperaments
- (4) education level
- (5) working conditions
- (6) future outlook
- (7) earnings
- (8) hours of work/travel
- (9) physical demands
- (10) physical activities
- (11) indoor/outdoor
- (12) career fields

This prioritizing of topics is an important exercise which requires clients to examine their occupational needs.

As the counselees select their likes and dislikes relative to the different topics, CHOICES sorts through its file and eliminates those occupations which do not match the input. The results of the career decisions that are made are immediately available to the clients via a print-out of how many occupations are retained after each input. If the clients do not like the results of their decision, they can immediately change their minds. When the list of occupational options has been narrowed down to twenty-five or less, CHOICES will automatically print them. In its powerful search capacities, CHOICES, along with SIGI, has been evaluated as superior to other systems (Florida Research Center, 1979).

EXPLORE provides the clients with a low-risk environment where their career values can be examined. The clients have the opportunity to weigh their career judgements.

SPECIFIC. After making decisions and prioritizing their values in EXPLORE, the clients' need for further information on their occupational options can be provided via SPECIFIC. Through SPECIFIC, career information is provided in an efficient manner on the twelve topics which were used in the EXPLORE section. The clients need only input the "CHOICES number" of the job which is located in the CHOICES Index and determine on which topics they would like to receive information. In

order to insure accurate and reliable information, SPECIFIC is continuously updated (Florida Center for Career Development Services, 1981).

COMPARE. The COMPARE Route is the recommended search strategy for the counselees who have an interest in comparing two or three occupational alternatives. Simultaneously, the clients can obtain information on up to three occupations in a table format which allows them to easily see the salient differences and similarities between them. The table has topic headings such as aptitudes or interests on the left margin and the occupational titles across the top of the page.

After completing RELATED, the next step for the clients would be to return to SPECIFIC or COMPARE to obtain detailed information for those related occupations which interest them (Florida Center for Career Development Services, 1981).

Through the various ROUTES of EXPLORE, SPECIFIC, COMPARE, RELATED, the clients have ready access to both a guidance and occupational information components. In evaluating the suitability of its access strategies, the Florida Research Center (1979) stated: "Of all of the systems, CHOICES offers most flexibility in terms of user access" (p. 18).

The CHOICES interaction with the individual during the various routes has been written with an effort to put the clients at ease and has been described as "a very 'friendly' one" (Florida Research Center, 1979, p. 15). For clients who are anxious or from lower socio-economic background, this feature can be important in order to avoid intimidation

by the computer terminal and to insure their completion of the CHOICES program (Florida Research Center, 1979). With its reading level of between ninth and tenth grade, CHOICES should not provide disadvantaged undergraduates with any difficulty (De Cristoforo, 1980). The Florida Research Center (1979) stated: "Of all of the systems, CHOICES offers most flexibility in terms of user access" (p. 18).

In conclusion, CHOICES assists the counselor by exposing the counselees to the wide range of opportunities that are available to them through the exploration of an extensive data file. "The immediate reality testing in a low-risk counselling environment would provide the counselor and client with valuable information to discuss within the vocational counselling process" (Turgeon, 1979, p. 161). Additionally, CHOICES can provide the client with an up-to-date vocational information library which is easily accessible.

Research on CHOICES

A number of research studies have been completed on the CHOICES system with the majority of them conducted in Canada. This section will review Canadian and the limited amount of research done in the United States.

In an attitudinal study of student response to CHOICES in 1977 at Sir John A. MacDonald High School in Ottawa, 94% of student users liked or strongly liked this computerized guidance system. Jarvis (1978) reports that

It appealed to them because it was fun, easy to use, and educational. Most important to them, it was non-threatening, and it accepted any response they made. (p. 9)

After utilizing CHOICES, 84% stated that they had broadened their career plans. Over 90% would recommend the system for other students of their age. With the use of their CHOICES print-out, two-thirds of the users felt that they would now be able to discuss more effectively their career plans with their parents. Typical student responses to CHOICES follows:

One impression, after sitting for a few moments at the console, is that of awe, because of the speed and sureness with which the machine responds.

It is a fun experience. Because of the constant need for my reactions, I felt very active, my mind working all the time, as opposed to absorbing information on a passive basis. I think the more traditional means of providing vocational information do not generate mental activity as CHOICES does. (Jarvis, 1978, p. 9)

In a study by the Department of Manpower and Immigration (1978), two separate research studies were conducted to assess the impact of CHOICES on the following two populations: (1) General users where the subjects, who had an average age of twenty, were clients of five Canada Employment Centers in British Columbia and Alberta and (2) students attending Vancouver Community College who were enrolled in a Basic Training for Skills Development (BTSD), which was an academic upgrading course for adults. For the general users, CHOICES received more acceptance especially of the terminal interaction when compared to the second group. The results of the utilization of CHOICES with the general users was described as the following:

The result of the use of CHOICES appears to lead to increased internal orientation of career planning, to increased career implementation, and to increased ability to select jobs which are more personally suitable in terms of environmental working conditions.

These results are characteristic of increased career maturation. (Department of Manpower and Immigration, 1978, p. 4)

The research investigation of the BTSD student's interaction with CHOICES involved completion of Super's Career Development Inventory. The results showed greater crystallization of career choice by CHOICES clients. In summarizing, the investigator states that the results of the studies on both populations indicated that:

CHOICES appears to be an effective method for stimulating career maturation for clients requiring it, and does so in a reduced period of time, thereby indicating increased efficiency over current career counseling methods. (Department of Manpower and Immigration, 1978, p. 8)

Cassie (1979) in a project funded by the Ministry of Education of Ontario evaluated the effectiveness of CHOICES and compared selected aspects of CHOICES with the Student Guidance Information Service (S.G.I.S.). S.G.I.S., which is a batch computer-assisted career guidance service, was developed by the Ontario Ministry of Education. The population for the investigation was students in four Ontario secondary schools who were provided with access to both CHOICES and S.G.I.S. for a three-month period. Students interacting with CHOICES completed a survey questionnaire and a selection of students who used both systems were observed while in the process of utilizing each system. The major conclusion of the study was Cassie's (1979) statement of the following: "Judicious use of either CHOICES or S.G.I.S. will result in gains in student career maturity attitudes" (p. 86). The suggestion was made that the move from batch to interactive processing

not be implemented for at least two years in order to allow for rapid changes in computer technology (Cassie, 1979).

An evaluation of CHOICES by the Florida Research Center (1979) which was prepared for Florida Occupational Information Coordinating Committee had the following general finding:

- (1) CHOICES is a flexible system . . .
- (2) CHOICES strengths are found in its career guidance as compared to its occupational information aspects.
- (3) CHOICES requires variable levels of counselor involvement depending upon: client reading/ comprehension levels, nature of CHOICES counseling application (career guidance vs occupational search).
- (4) CHOICES requires some occupational self-awareness, but may stimulate it for some clients through its friendly communication medium.
- (5) Consideration should be given to developing Spanish language versions as well as localizing the occupational file. (p. 3)

The Florida Research Center's evaluation refers to the Morgan Report and the 1978 S.O.I.C.C. study by North Carolina which evaluated CHOICES favorably. Summarizing a comparison of several computer systems, the following positive features of CHOICES are noted:

Hard copy print terminals, user feedback, powerful search strategies, relatively short session time, and consideration of extensive in-service training makes CHOICES an attractive system from a comparative standpoint. (Florida Research Center, 1979, p. 18)

In a comprehensive CHOICES pilot study which was conducted by the British Columbia Occupational Training Council and the British Columbia Systems Corporation (1980), the effectiveness of CHOICES as a career counseling technique was confirmed and the recommendation was made for the universal implementation of the system on a province-wide basis in

the public schools and post-secondary institutions. From February to June of 1980, research data was gathered on CHOICES at twelve pilot sites via questionnaires given to the following groups: (1) students (2) parents (3) principals (4) superintendents, and (5) counselors. Three independent observers, who had no connections with either CHOICES or the school system, conducted interviews with users, counselors and a principal of a secondary school.

Due to difficulty in collecting data from the field, student/parent questionnaires were received from only 142 of the approximate 2,700 students who utilized CHOICES during the pilot study. Of this group, 83% of the students reported that they were satisfied or very satisfied with the system with 91% feeling that CHOICES was easy or very easy to utilize. The suggested list of occupations was judged as satisfactory by 73% of the students with 61% reporting that the system assisted them in the selection of a career.

The independent observers reported that the CHOICES program was positive in its effect on students. "Students seemed to realize that their career possibilities were much wider than they had originally thought" (British Columbia Occupational Training Council and British Columbia Systems Corporation, 1980, p. 5.8). One observer stated that he had difficulty finding a student who reported a negative reaction.

The counselors who participated in this pilot program were enthusiastic in their support of CHOICES. They recommended that all counselors in the school should receive training on CHOICES in order to share the workload and that the system should be considered as just one

part of a total vocational counseling and career education program. For follow-up research by the students after the use of CHOICES, a Career Resource Center was suggested by the counselors as a necessary component of the total package.

As a result of the positive feedback on CHOICES by students, parents, principals/superintendents, counselors, and independent observers, the CHOICES Evaluation Committee of the Occupational Training Council recommended the implementation of the system throughout British Columbia in secondary and post-secondary public institutions. In noting the impact of CHOICES on the twelve pilot sites, the following observation was made:

The major benefit of the system has been the renewed interest in career education and career counselling that has taken place in the locations where CHOICES has been placed. The system is so attractive to students that they demand to use it. Counsellors who really have not been that interested in career counselling have suddenly found that they must up-grade their understanding and knowledge in order to meet the needs of the students. Definitely, CHOICES has the ability to bring a major emphasis to career counselling and career education. It literally has the power to re-focus the thrust of guidance and counselling in the schools of British Columbia. (British Columbia Occupational Training Council and British Columbia Systems Corporation, 1980, p. 8.5)

In a less comprehensive research project done in New Brunswick, Jean-Louis Guerette (1980) concentrated on surveying the attitudes of high school users toward CHOICES. In this limited research project, a sample of 99 eleven and twelfth grade students completed a 15 item Student Attitude Questionnaire which collected information on the following general areas:

- (1) General Reactions and perceived gains of students from the use of CHOICES
- (2) Effects of CHOICES on Career planning and career decision-making as perceived by students
- (3) Effects of CHOICES in their discussion with counselors, teachers, and parents as perceived by students.
- (4) Effects of CHOICES on students' immediate educational goals and future career goals.
(Guerette, 1980, p.2)

Although student responses to Guerette's survey on CHOICES were mixed, the overall evaluation of the system was positive. Although 89% of the users reported that their experiences with CHOICES were beneficial, only 38% on question five indicated some change in their future career plans. Students were asked to indicate careerrelated activities that they initiated following their use of CHOICES. Seventy-seven percent had conducted career discussions with their parents and 33% had received counseling on their career from the school guidance counselor. In the final conclusion to the research project, the recommendation was made that CHOICES be implemented as a part of school guidance program for students in grades nine to twelve (Guerette, 1980).

In another attitudinal survey on CHOICES, De Cristoforo (1980) investigated the response to the system by a sample of student users at the University of Florida. The revised version of the Pyle and Stripling's Survey Form (1976) which was used contained eight items with five questions relating to the degree to which the system helped the users with information about occupations, choosing a career, clarifying values, developing decision-making skills, and academic planning. On the last three items, the students were questioned about the clarity of

the instructions, their enjoyment of CHOICES, and whether they felt that other students would benefit from this activity. A comparative analysis was made between S.I.G.I. and CHOICES using Pyle and Stripling's (1976) research data which utilized the same questionnaire on a sample of community college students.

The overall results showed that CHOICES was not as well-received as S.I.G.I. with 66% of its users reporting a positive response to the activity in comparison to 74% of the S.I.G.I. clients.

Two differences between the two systems were noted in the response to the statements "aided me in choosing an occupation" and "aided me in my academic planning." While 47% of S.I.G.I.'s sample felt that they received help in choosing an occupation, only 23% of CHOICES's users responded positively to this statement. Sixty-nine percent of S.I.G.I. users as compared to 35% of CHOICES students felt that they had received help in academic planning.

However, 57% of the students were unsure if CHOICES helped them choose an occupation. As De Cristoforo (1980) suggests: "This fact is important, since it does not mean that CHOICES did not help them, only that the students could not make a definite judgement immediately after using CHOICES" (p. 24).

Ninety percent or more of the respondents indicated that CHOICES provided helpful occupational information, contained clear instructions, was an enjoyable activity, and would be beneficial to other students. In fact, 100% stated that they found the system enjoyable. No difference was found between the response of male as compared to the

response of female students who participated in the study. De Cristoforo (1980) concludes that:

All in all, the CHOICES survey revealed wide acceptance by its users, no difference in attitude by sex, and very little difference in attitude by grade level. (p.26)

In a recent research article, Reardon, Bonnell, and Huddleston (1981) compared the student satisfaction ratings for CHOICES with those of the Self-Directed Search (SDS), which is a pencil and paper career planning guide. The 75 subjects completed both treatments and two research instruments that assessed their reactions to CHOICES and SDS. The student volunteers preferred CHOICES over SDS, although both programs were positively rated. The students indicated that CHOICES was more interesting, and it was both an enjoyable and a beneficial use of their time according to the volunteers. Several positive comments about CHOICES were not made about the Self-Directed Study:

"I had more fun with CHOICES."

"I enjoyed CHOICES and will use it again."

"CHOICES was really great --the best!"

(Reardon, Bonnell, and Huddleston 1981, p. 6)

CHOICES was more effective than the S.D.S. according to the research data in encouraging client's information-seeking behavior. The seeking of more information about occupations and other vocational topics has been recognized as an important outcome of career guidance treatments (Reardon, Bonnell, and Huddleston, 1981).

The breakdown of the volunteers by sex who participated in the research project by Reardon, Bonnell, and Huddleston (1981) showed three times as many females as males or 77% to 23%, respectively. An analysis of students who sought assistance at the Curricular-Career Information Service (CCIS) during the winter term of 1980 showed that there were 71% females versus 29% males.

In conclusion, Reardon, Bonnell, and Huddleston's (1981) investigation indicated that students preferred the computer based system over the pencil and paper career exploration program. They were more likely to recommend to their friends the use of CHOICES, rather than of the S.D.S. Reardon, Bonnell, and Huddleston (1981) suggests that:

It is apparent that the novelty of CHOICES, an interactive computer program which personalizes communication to users and is immediately responsive to queries, strongly promotes the playful exploration of self and occupational information considered desirable for effective career planning. (p. 7)

Further research on CHOICES, is essential due to its relatively new status as a computerized guidance system (Cassie, 1979). CHOICES has only been utilized in a modified form in Florida since 1978. Although a comprehensive longitudinal study of CHOICES began in Canada in 1976, only a few research studies have been conducted in the United States. New research on CHOICES will provide counselors with needed information to evaluate the value of this new system.

CHAPTER III

METHODOLOGY

The purpose of this study was to assess the effectiveness of CHOICES, a computerized guidance system, in improving the career decision making of university students. The effectiveness of CHOICES in promoting career decision making was measured through the utilization of the Career Decision Scale and the Assessment of Career Decision Making.

The general method of the study involved the assignment of undergraduate and graduate university students to either an experimental or a control group using a systematic sampling pretest-posttest design. Although the control group did not receive any treatment during their participation in the study, the members had the opportunity to utilize CHOICES immediately following the completion of their part in the study.

The research design, hypotheses, population, sampling procedures, experimental procedures, and instrumentation are reported in this chapter. The chapter concludes with the data collection, data analysis, methodological assumptions, and limitations.

Research Design

The experimental research design chosen was the control-group pretest-posttest with the students being assigned systematically not randomly. This research design was represented as follows (Campbell and Stanley, 1963):

<u>GROUP</u>	<u>PRETEST</u>	<u>TREATMENT</u>	<u>POSTTEST</u>
RE	$O_1 O_2$	X	$O_1 O_2$
RC	$O_1 O_2$		$O_1 O_2$

In this design, internal validity was strong and has been adequately controlled (Isaac and Michael, 1971). However, since external validity was not rigorously controlled, the following sources of invalidity threatened the research: (1) interaction of selection and treatment, (2) interaction of pretesting and treatment, (3) reactive effects of experimental procedures, and (4) multiple treatment interference.

Hypotheses

The following null hypotheses were tested by the research design.

- H_o 1: There will be no statistically significant differences between the scores for the experimental and the control groups on the Career Decision Scale.
- H_o 2: There will be no statistically significant differences between the scores for the experimental and controls group on the Assessment of Career Decision Making.
- H_o 3: There will be no statistically significant differences between the scores for the males and females in the treatment and control groups on the Career Decision Scale.
- H_o 4: There will be no statistically significant differences between the scores for the males and females in the treatment and control groups on the Assessment of Career Decision Making.

Population and Sample

The population for this study consisted of the undergraduate and graduate students at the University of Central Florida (U.C.F.) in Orlando, Florida which was formerly called Florida Technological University. The University of Central Florida is the newest member of the State of Florida's university system with construction on the campus

beginning in 1966. Located in the East Central Florida region with a population estimated at over 1.3 million, the University of Central Florida offers a variety of broad academic programs to lower division, upper division, and graduate students. The population of 13,500 students based on count of students who matriculated during the winter of 1982, consisted largely of commuter students with dormitory space for only 800 students (The University of Central Florida's Catalogue, 1982-83). The minority population at the University of Central Florida is 10% of the total population.

The Selection of Subjects

The experimentally accessible population from which the 136 students were selected consisted of undergraduate and graduate students who voluntarily requested to utilize CHOICES at the Cooperative Education and Placement Center at the University of Central Florida. The student volunteers included representatives from the freshman, sophomore, junior, senior, and graduate classes at the University of Central Florida. All students who participated in this study had expressed a need for receiving assistance with career development as evidenced by the fact that they had voluntarily requested the utilization of CHOICES.

Sixty-four students were assigned to the control group and 72 to the experimental group. The students were systematically selected for each group by assigning the even-numbered volunteers to the experimental group and the odd-numbered students to the control group. If research data could not have been collected for at least 60 students, the investigation would have been terminated.

Experimental Procedures

Experimental Group

Specific experimental procedures were followed with the students who were assigned to the experimental group in this study. Following the request to utilize CHOICES, the students were asked to fill out both a demographic information sheet and a consent form. After the assignment of an appointment time for CHOICES, the students were given the CHOICES Guidebook which contained the worksheet and the pretests of the Career Decision Scale and the Assessment of Career Decision Making. Only brief instructions were given for the completion of the CHOICES Guidebook, Career Decision Scale, and the Assessment of Career Decision Making since they were basically self-explanatory.

The utilization of CHOICES in this research project involved the following three steps which are described in detail:

- (1) Completion of CHOICES worksheets in the CHOICES Guidebook (30-45 minutes).
- (2) Individual Orientation on the computer's operation by the career counselor (5-10 minutes).
- (3) Actual utilization of CHOICES (45-60 minutes).

CHOICES Guidebook

The CHOICES Guidebook, which was developed by the Center for Career Development Services in Tallahassee, Florida, contains a brief orientation to the CHOICES system with an explanation of what CHOICES might do for the clients. The four routes of CHOICES (EXPLORE, SPECIFIC, COMPARE and RELATE) are briefly reviewed as are the 12 different topics such as aptitudes, temperaments, and interests. During the first exercise in the guidebook, the clients were requested to

prioritize the 12 topics in the order of decreasing importance to them. This exercise serves the important functions of teaching clients to weigh the importance of various factors when making decisions (Florida Center for Career Development Services, 1981). The rest of the guidebook concentrates on encouraging clients to choose their likes/dislikes as related to the 12 different topics. As an example, the clients select their likes/dislikes from among the following abbreviated descriptions of the different factors for the topic of INTERESTS:

- (1) Things, Numbers and Objects
- (2) Business Contacts
- (3) Routine and Organized
- (4) Social Welfare
- (5) Direction and Control
- (6) Communication
- (7) Scientific and Technical
- (8) Abstract or Creative
- (9) Machines and Processes
- (10) Clearly Visible Results

In the guidebook, each specific factor is explained in detail with pictorial illustrations for certain ones.

The average client completed the guidebook in thirty to forty-five minutes. However, no time frame for completion of it was given to the students. They were only told to complete the guidebook prior to using the system.

Orientation Session

The brief orientation session, which was conducted at the terminal, immediately prior to the actual utilization of CHOICES, provided the clients with basic information on how to operate the terminal. The terminal was located in its own private room at the Cooperative

Education and Placement Center to minimize distractions. One of the career planning and placement counselors which was employed by the Center demonstrated how to sign-on, what to do if a mistake was made while on CHOICES, and how to sign-off. The completed guidesheet was reviewed by the counselor to determine that the clients understood the directions for its completion in the guidebook. The guidesheet was briefly discussed with the clients if any particular problems were noted. When reviewing the guidesheet with the clients, the counselors did not impose their values or give their knowledge to the clients who were allowed to learn and experience on their own (Florida Center for Career Development Services, 1981). The entire one-to-one orientation session was completed in five to ten minutes. At its termination, the clients were told to request the counselor's assistance during the CHOICES program if they had further questions or problems.

Utilization of CHOICES

The actual utilization of CHOICES will not be discussed in detail here, as a full explanation of the system was found in Chapter Two. The first-time CHOICES clients completed the Route called EXPLORE. If time allowed, they were encouraged to spend time in the other Routes. However, the number of Routes explored were left to the discretion of the clients.

Control Group Procedures

The control group was exposed to the same experimental procedures as the experimental group with the exception of the treatment as Isaac and Michael (1971) have suggested. When they requested assistance with

their career development through utilization of CHOICES, the clients in the control group were assigned an appointment time for the following week. The students were requested to fill out a demographic information sheet, a consent form, and to complete the Career Decision Scale and the Assessment of Career Decision Making which served as pretests. During their scheduled appointments of week two, the Career Decision Scale and the Assessment of Career Decision Making were completed again as posttest instruments before the students were allowed to utilize the CHOICES system.

Instrumentation

Career Decision Scale

The Career Decision Scale (Osipow, Carney, Winer, Yanico and Koschier, 1976) was designed to identify barriers that prevent individuals from making career decisions. The 19 test questions on the instrument utilize Likert-type items. The certainty of career choice and school major are assessed on questions one and two. The test questions three through 18 are utilized to indicate indecision factors with item 19 being an unscorable, open-ended question.

The administration of the Career Decision Scale is simple with adequate instructions which allow the student a choice of one of four response categories. Ten to 15 minutes is adequate testing time for individuals with average reading skills (Osipow, Carney, and Barak, 1976).

The reported test-retest correlations of items on the Career Decision Scale range from .70 to .90 for the entire scale (Osipow,

Carney, and Barak, 1976; Slaney and Palko-Nonemaker, 1981). Slaney and Palko-Nonemaker (1981) found the lower test-retest correlation of 0.70 which they based on six week intervals.

Studies on the Career Decision Scale have demonstrated its validity; a number of research projects correlate it with various populations who expressed career indecision prior to their involvement with a career development treatment. Taylor (1979) researched the effects of a residential career exploration program on college students. Other studies which indicate the potential of the instrument for identifying changes brought about through interventions to reduce career indecision include the following: Carney (1977b), Cranston (1978), Osipow, Carney, and Barak (1976), and Sutera (1977).

Norms are available on the Career Decision Scale on undecided college freshmen, college students, and high school students. The norms on the college population were developed through the testing of college students at different levels and in different majors.

To conclude, the Career Decision Scale, which is a simple test to administer, has adequate reliability and evidence of its validity has been produced by studies utilizing the instrument (Osipow and Waddell, 1980). Norms are available for the college population.

Assessment of Career Decision Making

The occupational scale of the Assessment of Career Decision Making, (ACDM), a self scored and self-administered instrument, was utilized in this research project. The occupational scale measures the degree of commitment and the certainty of one's choice of a future occupation.

This 20 item scale is representative of a single, bi-polar continuum with a negative and a positive pole. It has been normed for use with high school, college, and adult populations. The test-retest reliability for a two-week interval for the occupational scale was measured at 0.83 during research on 73 undergraduates (Harren, 1976; Harren, Kass, Tinsley, and Moreland, 1978). Research on the ACDM and its predecessor, the Vocational Decision Making Checklist, has supported its use as a research instrument and its validity (Harren, Kass, Tinsley, and Moreland, 1978). To summarize, the ACDM is a valuable instrument with established reliability and validity which has attracted positive research (Holland, Magoon, and Spokane, 1981).

Data Collection

The instruments, the Career Decision Scale and the Assessment of Career Decision Making, were administered as pretests to both the experimental and the control groups at the time of their initial request to utilize the services of CHOICES. The posttests for the experimental group were administered immediately following the completion of the CHOICES program by the clients. Appointments were scheduled approximately one week following their initial request to interact with the CHOICES system. The control group completed the posttests prior to utilization of the system.

Data Analysis

In order to analyze the data produced by this study, both analysis of variance and covariance were utilized. The analysis of variance on the pretests indicated that the experimental and the control

groups did not begin statistically equivalent. For this reason, the covariance was needed in order to control for the initial differences between the experimental and the control groups. An F ratio was produced by both the analysis of variance and the covariance which indicated where there were statistically significant results. The 0.05 confidence level was selected as the criteria that would determine the level of significance.

Assumptions

To conduct the study, the following assumptions were made:

1. Career decision making of students is a variable that can be measured.
2. Students will honestly report the barriers to their career decision making on the criterion instrument.

Limitations of the Study

As is true in any investigation, certain limitations existed that affected the results of the study. The following methodological limitations were noted for this study:

- (1) The study consisted of a sample of undergraduate and graduate students who by volunteering demonstrated their interest in receiving assistance for their career decision making. Generalization to undergraduates and graduates who lack the motivation to receive career assistance was not recommended.
- (2) The subjects could have been influenced by the pretest to participate in other activities that could have facilitated their career development. These interventions could have had an influence on the scores on the post-tests. However, the short time between pretest and the posttest limited the effect of this factor.
- (3) The use of the randomized control group pretest-post-test research design did not rigorously control external validity.

CHAPTER IV

RESULTS

This study sought to examine the impact of CHOICES on the decision making of undergraduate and graduate university students through the utilization of the Career Decision Scale and the Assessment of Career Decision Making. The experimental research design chosen was the systematic sampling pretest-posttest. The Statistical Package for the Social Sciences (SPSS) was used to conduct the data analyses.

In order to evaluate the four null hypotheses, an analysis of variance was utilized. The .05 confidence level was selected as the criterion to determine significance. The analysis of variance is a powerful method of data analysis which has the capability of simultaneously testing the homogeneity of a set of means. A F ratio is produced by the analysis of variance which indicates if the results are significant. Since the analysis of variance indicated that the experimental and control groups did not start off statistically equivalent, covariance was utilized to control for the initial differences.

The findings presented in this chapter consist of the following: (1) description of the sample, (2) analyses of variances, (3) findings related to each hypothesis, and (4) conclusion.

Description of the Sample

The sample of 136 students was selected from the undergraduate and graduate students who voluntarily requested the utilization of CHOICES. The experimental and control groups consisted of the following breakdown by sex: (1) 69 (51%) males, (2) 67 (49%) females. Although an attempt was made to attract an equal proportion of students from each class standing, the sample was heavily weighted towards seniors with juniors representing the next largest group by class standing. The breakdown by class standing was the following: (1) 21 (16%) freshmen, (2) 18 (13%) sophmores, (3) 31 (25%) juniors, (4) 49 (36%) seniors, and (5) 17 (12%) graduate students.

Analysis of Variance

Analysis of variance was used to test for the statistical significances of the different sources of variation that were being studied in this research project. The first statistical analysis was to determine if the experimental and control groups were statistically equivalent. Analysis of variances was conducted on the pretests of the experimental and the control groups on both of the instruments used in this research project in order to make this determination. As reported in Table 4-1, the analysis of variance was statistically significant for both the pretests of the Career Decision Scale and the Assessment of Career Decision Making. This indicates the probability that the experimental and control group initially were not statistically equivalent on the Career Decision Scale and the Assessment of Career Decision Making when they were given as pretests.

TABLE 4-1
ANALYSIS OF VARIANCE FOR THE PRETEST

<u>PRETEST OF CDS</u>					
<u>Source</u>	<u>df</u>	<u>Sum of squares</u>	<u>Mean squares</u>	<u>F Ratio</u>	<u>Significance of F</u>
Between Groups	1/130	298.272	298.272	3.748	0.055**

<u>PRETEST OF ACDM</u>					
<u>Source</u>	<u>df</u>	<u>Sum of squares</u>	<u>Mean squares</u>	<u>F Ratio</u>	<u>Significance of F</u>
Between Groups	1/130	82.170	82.170	3.833	0.052**

* p = 0.05

**p = 0.01

The results of the analysis of variance on the posttests are reported in Table 4-2. For the dependent variables, a higher scale on the Assessment of Career Decision Making indicates an increase in career decision making. Conversely for the Career Decision Scale, a lower score indicates an increase in career decision making due to the elimination of barriers to career decision making. As the table indicates, no statistically significant differences occurred on the posttests for both the Career Decision Scale and the Assessment of Career Decision Making when they were analyzed using an analysis of variance. No significant difference was noted on the dependent variable of sex using the analysis of variance.

Due to the lack of equivalency on the pretests of the Assessment of Career Decision Making and the Career Decision Scale, covariance was selected as an additional method of statistical analysis to be utilized. The value of covariance as a statistical method is that it eliminates any initial differences in the experimental and control groups. The effect of covariance is to equalize the groups in respect to one or more control variables. Using covariance, as indicated in Table 4-3, the posttest scores on the CDS and the ACDM were found to be statistically significant. However, no statistically significant differences were found between males and females in the experimental and control groups using this method of statistical analysis.

Findings Related to Each Hypothesis

The first hypothesis focused on the statistically significant differences between the experimental and control groups as related to the Career Decision Scale.

TABLE 4-2
ANALYSIS OF VARIANCE FOR POSTTEST

<u>POSTTEST OF CDS BY EXPERIMENTAL GROUP</u>					
<u>Source</u>	<u>df</u>	<u>Sum of squares</u>	<u>Mean squares</u>	<u>F Ratio</u>	<u>Significance of F</u>
Between Groups	1/134	4.085	4.085	0.052	0.82

<u>POSTTEST OF ACDM BY EXPERIMENTAL GROUP</u>					
<u>Source</u>	<u>df</u>	<u>Sum of squares</u>	<u>Mean squares</u>	<u>F Ratio</u>	<u>Significance of F</u>
Between Groups	1/134	40.533	40.533	1.381	0.242

<u>POSTTEST OF CDS BY SEX</u>					
<u>Source</u>	<u>df</u>	<u>Sum of squares</u>	<u>Mean squares</u>	<u>F Ratio</u>	<u>Significance of F</u>
Between Groups	1/134	0.771	0.771	0.010	0.921

<u>POSTTEST OF ACDM BY SEX</u>					
<u>Source</u>	<u>df</u>	<u>Sum of squares</u>	<u>Mean squares</u>	<u>F Ratio</u>	<u>Significance of F</u>
Between Groups	1/134	11.227	11.227	0.380	0.539

* p = 0.05

**p = 0.01

TABLE 4-3
COVARIANCE FOR THE POSTTEST

<u>POSTTEST OF CDS BY GROUPS AND SEX</u>			
<u>Source</u>	<u>df</u>	<u>F Ratio</u>	<u>Significance of F</u>
Covariate Effects			
Pretest of CDS	1/130	64.069	0.000
Pretest of ACDM	1/130	11.534	0.001
Main Effects			
Group	1/130	8.839	0.004**
Sex	1/130	0.913	0.341
2-way Interaction			
Group/Sex	1/130	2/641	0.107
 <u>POSTTEST OF ACDM BY GROUPS AND SEX</u>			
<u>Source</u>	<u>df</u>	<u>F Ratio</u>	<u>Significance of F</u>
Covariate Effects			
Pretest of CDS	1/130	0.568	0.452
Pretest of ACDM	1/130	24.278	0.000
Main Effects			
Group	1/130	7.150	0.008**
Sex	1/130	0.011	0.917
2-way Interaction			
Group/Sex	1/130	0.016	0.009

* p = 0.05

**p = 0.01

- H₀ 1 There will be no statistically significant differences between the scores for the experimental and the control groups on the Career Decision Scale.

Significant differences were found between the experimental and control groups. Thus, the null hypothesis is rejected.

The second hypothesis of this research project was the following:

- H₀ 2 There will be no statistically significant differences between the scores for the experimental and the control groups on the Assessment of Career Decision Making.

Between the experimental and the control groups, significant differences were found on the scores of the posttests of the Assessment of Career Decision Making. The null hypothesis is again rejected.

The third hypothesis dealt with the difference between the scores of the two sexes on the Career Decision Scale in the experimental and control groups. It was hypothesized by this study that the effect of CHOICES on males and females as measured by the scores on the C.D.S. would not be different:

- H₀ 3 There will be no statistically significant differences between the scores for the males and the females in the treatment and control groups on the Career Decision Scale.

Since no statistically significant differences were noted, the null hypothesis was accepted.

The fourth hypothesis, which was the final one of this study, was the following:

- H₀ 4 There will be no statistically significant differences between the scores for males and females in the treatment and the control groups on the Assessment of Career Decision Making.

The null hypothesis was accepted due to the lack of significant differences for males and females on the scores on the Career Decision Scale.

Conclusion

To conclude, the results of the data analyses are summarized below:

- (1) To analyze the data, an analysis of variance was conducted with the .05 level of significance chosen.
- (2) To further analyze the data, covariance was used in order to remove any initial differences between the groups that were indicated by the analysis of variance on the pretests.
- (3) To summarize results for the dependent variables, the following was indicated by the data analysis. Significant differences were found between experimental and control groups on the scores for the pretests of the Career Decision Scale and the Assessment of Career Decision Making using an analysis of variance. Since the two groups were not initially statistically equivalent, both the analysis of variance and covariance were utilized to test for significant differences. Although the analysis of variance did not indicate any statistically significant differences for any of the dependent variables, the covariance indicated significant differences for scores on both the Career Decision Scale and the Assessment of

Career Decision Making for the experimental and control groups. Using covariance, no statistically significant results were found between the scores of the males and females in the treatment and control groups on both experimental instruments.

CHAPTER V DISCUSSION AND CONCLUSIONS

Summary

A number of studies have indicated the inadequacy of career counseling services at universities and the need for more effective methods of meeting the vocational counseling needs of students. Computerized guidance systems are a relatively new tool having the potential of assisting college and university students with their career development needs. The focus of this particular study is on CHOICES, a computer assisted guidance system, which has not been adequately researched particularly due to its relatively new status in the United States.

The purpose of this study was to examine the effectiveness of CHOICES in improving the career decision making of university students. The effectiveness was measured through the utilization of the following two instruments: the Career Decision Scale and the Assessment of Career Decision Making. The university students who participated in this research project were assigned to either an experimental or a control group using a systematic sampling pretest-posttest design. Six weeks following their participation in this research project, all of the students who utilized the CHOICES program received a follow-up questionnaire which requested information concerning the impact of the treatment on them.

In this chapter, the results of this research project are discussed. The organization of the remainder of Chapter V includes the following: (1) follow-up study, (2) conclusions, (3) limitations, (4) implications, and (4) recommendations.

Follow-Up Study

The purpose of the follow-up study was to provide limited longitudinal information on the impact of CHOICES on the university students who utilized the program. Approximately six to eight weeks following their use of this computerized guidance system, all students who participated in the research project received the CHOICES Follow-up Questionnaire (see Appendix). Although at different time intervals, all students in both the experimental and control groups utilized CHOICES. For this reason, the questionnaire was mailed to all students in both the experimental and the control groups with legible addresses. A total of 130 students were sent questionnaires with 75 students returning them by return mail or in person. A stamped self-addressed envelope was enclosed to encourage response. The majority of students addressed their own envelopes following the posttests.

The follow-up questionnaire indicated a positive response to the utilization of CHOICES. In Table 5-1, the responses of the students to the ten multiple choice questions are given. It was interesting to note that the majority of students (66%) who completed the survey indicated that they had chosen an occupation, and 69% percent of these students suggested that CHOICES had been either very helpful or somewhat helpful to them in choosing that occupation. The response to question number

TABLE 5-1
CHOICES FOLLOW-UP QUESTIONNAIRE

-
- 1) Utilization of CHOICES
 --Once (85%)
 --Twice (14%)
 --Three or more (1%)
- 2) Routes utilized
 --Explore (39%)
 --Specific (23%)
 --Compare (24%)
 --Related (14%)
- 3) Occupational Choice
 --Has choice been made?
 Yes (66%) No (34%)
 --Assistance provided by CHOICES
 --Very helpful (23%)
 --Somewhat helpful (46%)
 --Unsure (21%)
 --Somewhat unhelpful (10%)
 --Very unhelpful (0%)
 --Satisfaction with occupational choice
 --Very satisfied (35%)
 --Somewhat satisfied (38%)
 --Unsure (21%)
 --Somewhat unsatisfied (3%)
 --Very unsatisfied (3%)
 --Decisiveness about occupational choice
 --Very decided (30%)
 --Somewhat decided (53%)
 --Neither decided nor undecided (9%)
 --Somewhat undecided (5%)
 --Very undecided (3%)
 --Effect of CHOICES on occupational choice
 --Increased (16%)
 --Narrowed to several occupations (46%)
 --Confirm plans (24%)
 --Confuse (11%)
 --Other (1%)
- 4) Recommendation of CHOICES to friends
 Yes (76%) No (24%)
 --Number of friends recommended
 --One (13%)
 --Two (35%)
 --Three (25%)
 --Four (13%)
 --Five (14%)
- 5) Overall reaction to CHOICES
 --Very helpful (27%)
 --Somewhat helpful (60%)
 --Unsure (8%)
 --Somewhat unhelpful (4%)
 --Very unhelpful (1%)

five which dealt with their current level of satisfaction with their choice of an occupation was high with 73% stating that they were very satisfied (35%) or somewhat satisfied (38%). In order to determine the effect of CHOICES on the career decision making of the students, question number seven asked how CHOICES affected their consideration of occupations. The response to this question was mixed with the highest number (46%) feeling that CHOICES assisted them in narrowing down their options to several desirable occupations. The other responses were spread over the entire spectrum with the next largest category being the confirmation of plans by CHOICES (24%).

The positive response of students to a career development treatment can be measured in part by the number of friends that they recommend to the program. For this reason, the question relating to the number of friends who were recommended to use CHOICES was included in the survey. Seventy-six percent of the users did recommend CHOICES to their friends with the number of friends varying from one to over five.

To conclude, the students who responded to the follow-up questionnaire on CHOICES were on the average positive in their appraisal of the system. Eighty-seven percent concluded that CHOICES was very helpful (27%) or somewhat helpful (60%).

Conclusions

This research project indicates that the utilization of CHOICES as a treatment does increase career decision making as measured by the Career Decision Scale and Occupational Scale of the Assessment of Career Decision Making. Using covariance to analyze the data, the two null

hypotheses which dealt with the statistically significant differences between the experimental and control groups on the Career Decision Making and Assessment of Career Decision Making were rejected. The two null hypotheses which were formulated relative to males and females in the experimental and control groups were both accepted due to the inability to demonstrate a statistically significant difference on these two scales.

Because H_{01} was rejected, this study indicates that CHOICES does assist in eliminating barriers to career decision making as measured by the scores on the Career Decision Scale. As indicated in chapter three, the Career Decision Scale was designed to identify barriers that prevent the making of career decisions and to measure the removal of barriers to career decision making, rather than actual career decision-making itself.

The second hypothesis dealt with the statistically significant differences between the experimental and control groups on the Assessment of Career Decision Making. Because this hypothesis was rejected, the ability of CHOICES to improve career decision making as measured by the Assessment of Career Decision Making was demonstrated.

This study hypothesized that no differences would exist between the effect of CHOICES on males and females as measured by the scores on the Career Decision Scale. The third hypothesis was accepted since the results do not demonstrate any statistically significant differences between males and females on the Career Decision Scale as a result of treatment through the utilization of the CHOICES program.

The fourth hypothesis was concerned with the statistically significant differences between males and females in the treatment and control groups on the Assessment of Career Decision Making. CHOICES was not shown to affect differentially the decision making of females versus males.

With the rejection of two of the four null hypotheses of this study, the utilization of CHOICES as a treatment to facilitate career decision making has been supported. Its effectiveness with university students who are seeking to deal with the difficult developmental task of selecting a career has been confirmed. The acceptance of the null hypotheses relative to the sexes indicates that CHOICES is equally helpful to both males and females in promoting career decision making.

The validity of the Career Decision Scale and the Occupational Scale of the Assessment of Career Decision Making as measures of career decision making has been further established. These scales have enhanced their value as useful research instruments for measuring the effectiveness of career development treatments that are conducted during a limited period of time.

Reservations

The following might be limitations to this study:

1. The study population was limited to volunteers who requested utilization of the CHOICES program.
2. The population involved in this study did not contain a broad cross spectrum of students relative to class standing. The population was heavily weighted with juniors and seniors. More freshmen in particular were needed to provide a more balanced cross spectrum.

3. The experimental treatment could have influenced the subjects to participate in other activities that could have affected their career decision making.

4. The pretest could have affected the subjects' perception of the treatment and its effect on them.

5. The majority of the research was conducted during the summer months of June, July, and August when the on-campus student population is not entirely representative of the student body during regular semesters. A larger proportion of the population during the summer months is composed of career changers such as dissatisfied teachers.

6. There was limited counselor interaction with the clients during this research project.

Implications

The findings of this study suggest implications for counselors seeking to improve the career decision making of students in a university or college setting. University counselors have typically been inadequate in dealing with the career development problems of college students. Partially for this reason, a large percentage of college students graduate from universities without sufficient preparation to make the transition from the school to the workplace. Many graduates find themselves in unsatisfactory jobs and become disillusioned with the education that they worked for.

Computerized guidance systems such as CHOICES have the potential to assist counselors who seek to meet the important career development needs of college students. In this rapidly changing society, CHOICES

has the advantage of being easily updated with current information on new occupations that are constantly being created. The latest information can be made available to assist students in making their career decisions.

Since the CHOICES treatment does not require constant counselor supervision, the busy counselors have an additional tool which benefits the student while providing counselors with more time for individual and group counseling. If graduate students from the counseling department are available, the counselor can train them to work with CHOICES. Although this study involved limited counselor contact with the client, the flexibility of the CHOICES program is such that a considerable amount of counselor involvement is possible if adequate staffing exists. To conclude, this study has helped to provide credibility for a counseling tool that is relatively new yet effective.

Recommendations

With respect to the results of this study, this investigator recommends that the college and university counselors incorporate CHOICES into their overall career development program. This study indicates that CHOICES can assist university students with the difficult task of making a career decision. According to the follow-up study, CHOICES is perceived as a positive experience by the majority of its student users.

In view of the limited amount of research on the CHOICES program, further investigation of its value would seem to be needed in order to better establish its credibility. Research which made a determination

of the cost effectiveness of CHOICES would provide useful information. Future research on CHOICES would be recommended to incorporate a pre- and post-counseling session. A comparison study of the effectiveness of the CHOICES treatment with and without the pre- and post-counseling session would be of particular value.

Although this research project includes a six week follow-up questionnaire, the need for longitudinal studies exists. An understanding of the value of CHOICES and of computer assisted guidance in general would be enhanced by longitudinal studies conducted six months or longer after the intervention. These studies could focus on the long-term effects of the program on career maturity, career decision making, informational seeking behavior, and other aspects of career development.

Attention may also be directed at the effectiveness of the treatment across different age groups and class levels. The younger students who have greater exposure to the computer may be affected differently by exposure to the CHOICES program. Also, the effectiveness of treatment with varied populations such as the handicapped and the mid-life career changer would provide valuable information.

In conclusion, the results of this study confirm the value of CHOICES and of computerized guidance systems in an university career development program. For this reason, it is recommended that college and university counselors investigate the possibility of incorporating CHOICES or a similar computer assisted guidance system into their program.

APPENDIX A

INFORMED CONSENT

Dear U.C.F. Student:

The purpose of this letter is to request your participation in a doctoral study that is being conducted to determine the effectiveness of CHOICES. If you agree to become involved in this project, you will be asked to complete several tests at two different times which should not take more than fifteen minutes per sitting. Six weeks following your completion of the CHOICES program, a short follow-up questionnaire will be administered. If you are selected to be a member of the control group, you will be requested to delay for one week your utilization of CHOICES.

Participation in this project may assist you in thinking with more clarity about your career goals. CHOICES is available to you without participation in this research study. No monetary compensation will be awarded. If you have any questions about this study, please feel free to ask. Please complete the below consent form which is required by Federal guidelines.

Sincerely,

Flora Ann Pinder
Coordinator of Career
Planning and Placement

Informed Consent

I have read and I understand the request described above. I agree to participate in the research project.

Signature: _____

Please indicate phone numbers at which you do not mind being called and the best time of day to call you.

Home No.: _____ Business No.: _____

Before 8:00 a.m. _____
8:00 a.m.-12:00 a.m. _____
12:00 a.m.-5:00 p.m. _____
5:00 p.m.-9:00 p.m. _____
After 9:00 p.m. _____

Address: _____

APPENDIX B
DEMOGRAPHIC INFORMATION

Demographic Information

Name: _____ Date: _____

Social Security Number: _____

Major: _____ College: _____

1. Sex: _____ (1) Male _____ (2) Female

2. Age: _____

3. Year in college:

- _____ (1) First
_____ (2) Second
_____ (3) Third
_____ (4) Fourth

4. Race/Ethnic Data

- _____ (1) White (not of Hispanic origin)
_____ (2) Black
_____ (3) Hispanic
_____ (4) Asian or Pacific Islander
_____ (5) American Indian or Alaskan Native
_____ (6) Other (Specify): _____

5. Have you chosen an occupation? _____ Yes _____ No

6. How satisfied are you with your choice of an occupation?

CIRCLE ANSWER

5
very
satisfied

4

3

2

1
very
unsatisfied

APPENDIX C
CHOICES FOLLOW-UP
QUESTIONNAIRE

CHOICES FOLLOW-UP QUESTIONNAIRE

NAME: _____

DATE: _____

Check the appropriate letter on the questionnaire:

- (1) On how many occasions did you use CHOICES?

_____ (a) Once
_____ (b) Twice
_____ (c) Three or More

- (2) Check all of the routes of CHOICES that you used.

_____ (a) EXPLORE
_____ (b) SPECIFIC
_____ (c) COMPARE
_____ (d) RELATED

- (3) Have you chosen an occupation? _____ (a) Yes _____ (b) No

- (4) If yes to question three, how would you rate CHOICES in assisting you in choosing an occupation?

_____ (a) Very helpful
_____ (b) Somewhat helpful
_____ (c) Unsure
_____ (d) Somewhat unhelpful
_____ (e) Very unhelpful

- (5) How satisfied are you with your choice of an occupation?

_____ (a) Very satisfied
_____ (b) Somewhat satisfied
_____ (c) Unsure
_____ (d) Somewhat unssatisfied
_____ (e) Very unsatisfied

- (6) How decided do you feel about your choice of an occupation?

_____ (a) Very decided
_____ (b) Somewhat decided
_____ (c) Neither decided nor undecided
_____ (d) Somewhat undecided
_____ (e) Very undecided

- (7) How did using CHOICES primarily affect the occupations that you are considering?

☐ (a) Increased
☐ (b) Narrowed to several occupations
☐ (c) Narrow to one occupation
☐ (d) Confirm plans
☐ (e) Confuse

- (8) Did you recommend CHOICES to any of your friends?

☐ (a) Yes
☐ (b) No

- (9) If yes is your answer to question eight, how many friends did you recommend to utilize CHOICES?

☐ (a) One
☐ (b) Two
☐ (c) Three
☐ (d) Four
☐ (e) Five or More

- (10) Please summarize your overall reaction to the experience of using CHOICES.

☐ (a) Very helpful
☐ (b) Somewhat helpful
☐ (c) Unsure
☐ (d) Somewhat unhelpful
☐ (e) Very unhelpful

Your comments are welcome.

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BIOGRAPHICAL SKETCH

Flora Ann Pinder was born into a family composed of two military officers who had served during World War II. Her mother as a Chief Flight Nurse had worked at the front lines during the war. After traveling extensively throughout the United States during her first fourteen years, her family settled in Winter Park, Florida, with the retirement of her father from the military.

As an undergraduate student, Flora Ann studied English literature and Spanish at Stetson University in DeLand, Florida. A year studying at the University of Madrid provided her with fluency in the Spanish language. A M.A. degree in guidance and counseling was received from the University of South Florida in 1972.

During her work history, Flora Ann has been employed with Health Rehabilitative Services as a social worker and at Florida State Employment Office as an employment counselor. Since 1975, she has been a career planning counselor at the University of Central Florida in Orlando and is beginning her third year as the Assistant Director of Career Planning and Placement. While at the University of Central Florida, Flora Ann has taught career planning courses both at the university and as an adjunct at a local community college.

Flora Ann is married to Robert L. Jane, who is a second generation native of Winter Park, Florida. Mr. Jane, a self-employed businessman, is a consultant at the corporate level on self-funded insurance and owns a company that provides clerical services for the preparation of books and other lengthy manuscripts.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.



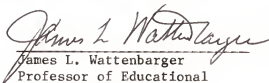
Paul Fitzgerald, Chairman
Professor of Counselor
Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.



E.L. Tolbert
Professor of Counselor
Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.



James L. Wattenbarger
Professor of Educational
Administration &
Supervision

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

Dean for Graduate Studies
and Research

December, 1982